THE
Palladium *Extraordinary*,

(PRICE 1s. 6*d.*)
For the Year of our Lord, 1763.
Completing the *Set* of all former PALLADIUMS.
Containing
A large IMPROVEMENT on the former PLAN, in a greater *Quantity* and *Variety* of *new*, *uſeful*, and *intereſting* SCIENCE than heretofore.
With general and particular *Chronological* TABLES, *Time* and *Tide* Rules, the *State* and *Motion* of the Heavens, an *Account* of the Year, *&c.*
The *Fifteenth* Number publiſhed.

By the Author of the *Royal Aſtronomer and Navigator.*

J Wale inv et del. *I.S.Müller Sc*

Britain long exercis'd in *Arts* and *Arms*,
(Acquiring *Glory* and averting *Harms*)
Unaw'd by *Threats* — ſhall meet her hoſtile Foe,
And, in a Tempeſt, drive th'impending *Blow*!

LONDON:
Printed for John Fuller, in *Blow-Bladder Street*.
M.DCC.LXIII.

w *Perpetual* TABLE for finding Month-days to the Week-days, the contrary.

NTHS in ny Year.	*Sunday Letters.*						
	G	F	E	D	C	B	A
an. Oct.	m	t	w	th	f	ſ	S
March. Nov.	th	f	ſ	S	m	t	w
pril. July.	S	m	t	w	th	f	ſ
May.	t	w	th	f	ſ	S	m
June.	f	ſ	S	m	t	w	th
Auguſt.	w	th	f	ſ	S	m	t
tem. Decem	ſ	S	m	t	w	th	f
Jnder the *Sun-* Letter for the ar, againſt the nth, ſtands the eek-day to 1, 15, 22, and 29 that Month, reckoning for-rd from that eek-day, and areſt Month-y, you find the onth-day to e Week-day re-ired.	1	1	1	1	1	1	1
	8	8	8	8	8	8	8
	15	15	15	15	15	15	15
	22	22	22	22	22	22	22
	29	29	29	29	29	29	29

EXAMPLE I. *To find the Month-y to the* Thurſday *after* March 8, -63, Sunday *Letter being* B, N. S. *See* Palladium 1762, *P.* 3.)

Under B, againſt *March*, ſtands t, r *Tueſday*, for 1, 8, *&c.* of that Ionth, and reckoning from 8 forward o th, or *Thurſday*, it will be the 10th f *March*, required.

EXAMPLE II, *To find the Week-day to* April 19, 1764, Sunday *Letter* G, *New Style.*

Under G, againſt *April*, ſtands S, *Sunday* to 1, 8, 15, *&c.* counting from S, from 15, to 19, forward in the Column againſt the Month, *April*, you find the 19th of *April*, on th, or *Thurſday*, required.

EXAMPLE for 1763, *Sunday* Letter B, *New Style.*

1763.	Month and Week-Days.						
A *New* GUIDE.	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
Under the Month Day, agt the Mth, ſtands the Week-day, and the contr.	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				
Jan. Oct.	ſ	S	m	t	w	th	f
Feb. March. Nov.	t	w	th	f	ſ	S	m
April. July.	f	ſ	S	m	t	w	th
May.	S	m	t	w	th	f	ſ
June.	w	th	f	ſ	S	m	t
Auguſt.	m	t	w	th	f	ſ	S
Septem. Decem.	th	f	ſ	S	m	t	w

EXAMPLE for 1764, *Sunday* Letters AG, *New Style.*

1764.	Month and Week-Days.						
A *New* GUIDE.	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
This *Form* for *Leap* and the former for a *com.* Yr, are all the *Forms.*	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				
Jan. April. July.	S	m	t	w	th	f	ſ
February. Auguſt.	w	th	f	ſ	S	m	t
March. Nov.	th	f	ſ	S	m	t	w
May.	t	w	th	f	ſ	S	m
June.	f	ſ	S	m	t	w	th
Septem. Decem.	ſ	S	m	t	w	th	f
October.	m	t	w	th	f	ſ	S

N. B. The Form and Uſe of the above *Tables* are *new.*

BRITISH MUSEUM

TABLE

TABLE of TIME and TIDE-RULES for the *Year* 1763.

Add to Mth Day for the ☽'s Age.		New ☽.	Full ☽.	Sun riſes. 1ſt	11th	21ſt	Sun enters		☉ and ☽ Places at New ☽.
	Days	th	th	h m	h m	h m		th	s d
Jan.	16	14	29	8 5	7 56	7 45	♒	19	9 25
Feb.	17	12	27	7 27	7 9	6 50	♓	18	10 24
Mar.	16	14	29	6 34	6 14	5 54	♈	20	11 24
Apr.	17	13	27	5 33	5 13	4 54	♉	20	0 23
May.	17	13	27	4 36	4 20	4 5	♊	21	1 22
June.	18	11	25	3 52	3 45	3 43	♋	21	2 20
July.	19	10	24	3 46	3 53	4 3	♌	23	3 17
Aug.	21	9	23	4 19	4 35	4 53	♍	23	4 16
Sept.	22	7	22	5 14	5 31	5 53	♎	23	5 14
Oct.	23	7	21	6 12	6 31	6 52	♏	23	6 14
Nov.	24	5	20	7 12	7 30	7 45	♐	22	7 13
Dec	25	4	20	7 57	6 5	6 8	♑	21	8 13

Add or ſub. fr. ☽ Southg herSettg or

☽'s Place.		Arc
3	Sign	$8^h\frac{1}{2}$
4	2	8 ¼
5	1	7 ¼
6	0	6 ¼
7	11	5 ¼
8	10	4 ¼
9		4

Ex. Feb. 1
Add 17
☽'s Age 18 Days.
Ex. Nov. 10
Add 24
Sum 34
Deduct 29
☽'s Age 5
Deduct 30 or 29, as 1ſt & 2d Col. make 30 or 29.

New ☽ 14th Day Jan.
New ☽ 7th Sept.

Full ☽ 27th Day Feb.
Full ☽ 22d Sept.

Againſt Jan. Sun riſes under

	h	m
1ſt	8	5
11th	7	56
21ſt	7	45

reſpectively.

Whence, the Sun's Riſing for the intermediate Days is quickly known.

Req. ☉ *Pla.* *May* 18, 1763
☉ enters ♊ the 21ſt
2^s 0^o
— 3 Ds.
♈ 1 27..18^d
☉'s Pl. req
Add or ſub. Deg. for Deg. above or und. ☉ entering a Sign.

Req. ☽ Pl *May* 18, 1763.
Ds
☽'s Age 5
by $13^o\frac{1}{6}$
make 2^s 6
☽ Pl. atN. 1 22
☽ P. 3^s 28
18th *May* required.

Req^d. the ☽ Riſing & Settin on 18th of *May* 1763.
☽ Pl. 2^s nearly | Arc $\pm 8^h\frac{1}{4}$
☽ Southg by *Ephem.* | 4
☽ ſets 12 ¼
☽ riſes 7 ¾
nearly, req^d.

Note, Moon's Southing equal her Age by 8 tenths for the Hours.

CHRONOLOGICAL NOTES for the Year.

Dom. Let. N. S.	B	*Yr. Jul. Period*	6474
——— O. S.	E	— *Olympiads*	2538
Golden Number	16	— *Foundat. Rome*	2515
Epact	15	— *of Nabonaſſar*	2509
Cycle of the Sun	9	— *Turkiſh Hegira*	1141
Indiction	11	— *Greg. Correction*	181

Jan. 30. Septuageſſ.
Feb. 6. Sexageſ.
13. ShroveSun.
16. Aſh Wed.
20. 1ſtS. in Lent
Ma. 27. PalmSund.
30. Good Fri.
Ap. 3. Eaſter Sun.
10. Low Sunday

May. 8. Rogat. Sund.
12. Aſcenſion-day
22. Whit-Sunday
29. Trinity-Sun.
Jun. 2. Corp. Chriſt.
No. 27. Advent Sund.

———————

II. Inviſ. Eclipſes ☉, April 13. October 7.

TIDE-RULES for ſeveral Places

Add $2^h\frac{1}{2}$ to the Time of the Moon's Southing for the Time of high Water at *London*. Alſo add 5 Hours more for the Time of low Water at *Graveſend*.

High Water, *b* before, and *a* after the Time at *London*.

		h	m			h	m
Buoy of Nore	*b*	1	30	*Plymouth*	*a*	3	10
Dartmouth	*a*	3	30	*Portland*	*a*	5	50
Dover	*b*	3	0	*Portſmouth*	*b*	2	0
Graveſend	*b*	1	20	*Rocheſter*	*b*	1	20
Hull	*a*	3	30	*Scilly Iſlands*	*a*	1	45
Harwich	*b*	3	30	*Spithead*	*b*	3	0
Mounts Bay	*a*	1	6	*Yarmouth Pier*	*b*	4	40

Examples. Time H. Water *Lond. May* 18, 1763, (☽ 5 Days old) $6^h\frac{1}{2}$; at *Plymouth* 9^h 40^m, or 3^h 10^m after; at *Portſmouth* $4^h\frac{1}{2}$, or 2^h bef. at *Spithead* $3^h\frac{1}{2}$, or 3^h bef.

DAYS fr. O. to N. *Style*; alſo advanced +, and retreated —, by the N. MOON, 4 or *Lunations*, in the Month-days, fr. O. to N. Style, or in either Style, *&c.*

Col. 1.	2.	3.	4.	5.	Col. 1.	2.	3.	4.	5.	Col. 1.	2.	3.	4.	5.
Centuries bef. Ch. N. S.	Ds. fr. O. to N. S.	Days Advance N. ☽ in O. S.	☽ A. & Epa. adv. fr. O. to N. S.	N ☽ ret. Ds. in N. S	Centuries bef. and ſin. Ch. N. S.	Ds. fr. O. to N. S.	Days adv. & retr. N. ☽ in O. S.	☽ A. & Epa. adv. & ret. fr. O. to N S.	N ☽ .&a. D. in N. S	Centuries ſin. Ch. N. S.	Ds. fr. O. to N. S.	Days retreat N. ☽ in O. S.	☽ A. & Epa. ret. fr. O. to N. S.	N ☽ ad. Ds. in N. S
	—	+	+	—		∓	±	±	∓		+	—	—	+
B. 6001	47	24	23	33	B. 2001	17	11	6	16	B. 2000	13	1	12	2
5901	46	24	22	32	1901	16	11	5	15	2100	14	2	12	2
5801	45	24	21	31	1801	15	11	4	14	2200	15	2	13	3
5701	44	*23	21	31	1701	14	10	4	14	2300	16	2	14	4
B. 5601	44	23	21	31	B. 1601	14	10	4	14	B. 2400	16	3	13	3
5501	43	23	20	30	1501	13	10	3	13	2500	17	3	14	4
5401	42	22	20	30	1401	12	9	3	13	2600	18	3	15	5
5301	41	22	19	29	1301	11	9	2	12	2700	19	4	15	5
B. 5201	41	22	19	29	B. 1201	11	9	2	12	B. 2800	19	4	15	5
5101	40	21	19	29	1101	10	8	2	12	2900	20	4	16	6
5001	39	21	18	28	1001	9	8	+ 1	11	3000	21	5	16	6
4901	38	21	17	27	901	8	8	— 0	10	3100	22	5	17	7
B. 4801	38	20	18	28	B. 801	8	8	0	10	B. 3200	22	5	17	7
4701	37	20	17	27	701	7	* 7	0	10	3300	23	6	17	7
4601	36	20	16	26	601	6	7	1	9	3400	24	6	18	8
4501	35	19	16	26	501	5	7	2	8	3500	25	6	19	9
B. 4401	35	19	16	26	B. 401	5	6	1	9	B. 3600	25	7	18	8
4301	34	19	15	25	301	4	6	2	8	3700	26	7	19	9
4201	33	18	15	25	201	3	6	3	7	3800	27	7	20	10
4101	32	18	14	24	101	2	5	3	7	3900	28	8	20	10
B. 4001	32	18	14	24	B. *b.* C. 1	2	5	3	7	B. 4000	28	8	20	10
3901	31	17	14	24	ſ. C. 100	—1	5	4	6	4100	29	8	21	11
3801	30	17	13	23	200	+0	4	4	6	4200	30	8	22	12
3701	29	17	12	22	300	1	4	5	5	4300	31	* 9	22	12
B. 3601	29	16	13	23	B. 400	1	4	5	5	B. 4400	31	9	22	12
3501	28	16	12	22	500	2	3	5	5	4500	32	9	23	13
3401	27	16	11	21	600	3	3	6	4	4600	33	10	23	13
3301	26	16	10	20	700	4	3	7	3	4700	34	10	24	14
B. 3201	26	*15	11	29	B. 800	4	2	6	4	B. 4800	34	10	24	14
3101	25	15	10	20	900	5	2	7	3	4900	35	11	24	14
3001	24	15	9	19	1000	6	2	8	2	5000	36	11	25	15
2901	23	14	9	19	1100	7	1	8	2	5100	37	11	26	16
B. 2801	23	14	9	19	B. 1200	7	1	8	2	B. 5200	37	12	25	15
2701	22	14	8	18	1300	8	1	9	1	5300	38	12	26	16
2601	21	13	8	18	1400	9	0	9	—1	5400	39	12	27	17
2501	20	13	7	17	1500	10	+ 0	10	+0	5500	40	13	27	17
B. 2401	20	13	7	17	B. 1600	10	— 0	10	0	B. 5600	40	13	27	17
2301	12	12	7	17	1700	11	0	11	1	5700	41	13	28	18
2201	18	12	6	16	1800	12	* 1	11	1	5800	42	14	28	18
2101	17	12	5	15	1900	13	1	12	2	5900	4[illegible]	14	29	19
										B. 6000	43	14	29	19

CONSTRUCTION *of the foregoing* TABLE.

TO find the Number of Days from Old to New Style, before Chriſt, for Years above whole Hundreds.

RULE. *Take the fourth from the Hundreds* before *Chriſt, then add 2 for the Difference of Style.*

N. B. The Difference of Days from Old to New Style, increaſed by 1, does not take Place till the 29th of *February* in the *Biſſextile*-Century, or 25th in the *Roman* Account; and continues the *ſame* from every *upper* to the next *under* Date.

To find the Number of Days from Old to New *Style*, ſince *Chriſt*, for Years above Hundreds.

RULE II. *Take the fourth and two from the Hundreds ſince* Chriſt, *for the Difference of Style.*

N. B. The *Moon's Age* and *Epacts* retreat —, in the Month Days the ſame Number of Days the New Moons or *Lunations* advance, +, from Old to New Style, and the *contrary*; being the Sum of 2 and 3 Columns with a contrary Sign. As 5 Col. is the *Sum* of 4th Col. and 10 Days, (Dif. Style) with *contrrry* Sign.

CHRONOLOGICAL RULES.

To find the Retreat of the Moon's Age, and conſequently Epacts, *in the Month-Days of the* Old *Style, or their Advance from the* new *to* old Style, *according to the eſtabliſhed* Rule *of* 1 *Day retreated in every* 300 *Years forward (in round Numbers) or* 8 *Days correctly retreated in every* 2500 *Years forward, (being at the mean Retreat of* 1 *Day in every* 110,7 *Years) from whence the Advance or Retreat of the New and Full Moons or* Lunations (having contrary Affections to her Age and Epacts) *from Old to New Style, and conſequently the* Gregorian *Epacts, as ſettled by Pope* Gregory, *are correctly determined.*

RULE I. Take the Difference between 17 and the Centuries above 17 Hundred *ſince Chriſt*, and divide that Difference by 25; multiply the Quotient by 8, and reſerve the Product. — Divide the laſt Remainder by 3, and *add* the Quotient to the Product *reſerved*. If there is now no Remainder, it will be the Retreat of the *Epacts*, or Moon's Age; if there is a Remainder, that *Sum* more 1, will be the Retreat in the Month-day *required*, from 1800, or from thoſe in the 17th Century ſince *Chriſt*.

Years
Example I. 47|00 ſince *Chriſt*.
17
——
25)30(1 by 8 = 8 reſerved.
25
3) 5(1 . . . 1
2 Rem. 1 add
— 10 Days Retreat of *Lunations*,
to

to be deducted from the Number of Days advanced from old to new Style, *viz.* 34, for the *Moon's Age*, and *Epact* retreated by that Difference, *viz.* 24 Days, from Month-day of the Moon's Age and Epact in the 17th Century ſince Chriſt, for thoſe of the preſent Date; as the *Lunations* will be advanced by the ſame Number of Days, in the *Month-days*, from old to new Style, and the *contrary*, in the preſent *Century*.

To find the Advance of the New Moon, or Retreat of her Age in the old Style, from 1800 back to the Year 6000 before Chriſt.

RULE II. Proceed as in the former Rule for finding the *Retreat* of the *Lunations* from 1800 to 6000 ſince *Chriſt*; only *ſubtract* an Unit from the Reſult of the Operation, when 0 remains; but when 1 or 2 remains, ſubtract Nothing; taking the Diſtance of *Centuries* back from the 17th Century, in this backward Computation.

Years

Example I. 47|00 before Chriſt.

Add 17 Centuries ſince Chriſt.

25)64(2 by 8 = 16

50

3)14(4 . . . 4

Rem. 2 Days + 20 Advance of the New [Moon.

Subtract 0.

Years

Example II. 5|00 ſince *Chriſt*.

17 Centuries ſince *Chriſt*.

25)12(0 × 8 = 0

3)12(4 . . 4

Rem. 0 4

Sub. 1

Advance of the new Moon + 3 Days.

The above 20 Days Advance to be *connected* with the 37 Days retreated from old to new Style; the Difference with a *contrary* Sign, being + 17 Days, that the Moon's Age and Epacts are advanced, or to be added to thoſe for old Style, in the 17th Century ſince Chriſt, for thoſe of *New Style*, in the preſent Century.

☞ The Moon's Age and Epacts advanced or retreated in Days forward or back, in the Month-days, from old to new Style, being determined as aforegoing, from the 17th Century O. S. to find, from thence, the *Epacts* for new Stile.

RULE. *Multiply the Golden Number for the Year by* 11, *and deduct the ſaid Retreat of the Moon's Age or Epact from the Product, dividing the Remainder by* 30, *and the laſt Remainder will be the Epact for the Year required, N. S.*

Examp. 1763, ſince *Chriſt*, Gol. N°. 16
by 11
176
Epact's Retreat fr. O. to N. S. Ds. — 11 by foregoing Table.
—— Advance fr. N. to O. S. } [+ 11 Days. }
30)165(5
150

Epact for 1763, N. S. reqd. 15 Rem.
Add 11 . . . . 26 Epact, O. S.

For EPACT O. S.

RULE. *Subt.* / *Add* } Days Diff. Styles to Epact for N. S. for Epact, O. S. for Years *b fore* / *ſince* } 300 ſince *Chriſt.*

To find the Moon's Age for any Day of the Month in any Year for which the Epact, *old or new Style, is given.*

RULE I. Reckon the Number of the Month from *March*, which is called 1; *April* 2, *May* 3, *&c.* to which Number add the Day of the Month, and Number of the Epact, rejecting 30, if above, and then you will have the Moon's Age. — Or you may uſe this

RULE II. *Jan.* 0, *Feb.* 2, *Mar.* 1, *Ap.* 2, *May* 3,
Ju. 4, *Jul.* 5, *Au.* 6, *Sep.* 8, *agree*;
Oct. 8, *Nov.* 10, *Dec.* 10 — *to Epact add*
With Day — bate 30 — *Age or Change is bad.*

TO the AUTHOR of the PALLADIUM.

Sir,

Reading t' other Day the *Univerſal Hiſtory*, I met with the underneath *ænigmatical Epitaph*. If it has not been publiſhed in your *Palladium*, I ſhould be glad to ſee it inſerted, and an *Explanation* by any of your ingemious Correſpondents.

I am, Sir, your's, &c.
G. HAYDEN.

Ælia Lælia Criſpis,
Nec Vir, nec Mulier, nec Androgyna,
Nec Puella, nec Juvenis, nec Anus,
Nec Caſta, nec Meretrix, nec Pudica,
Sed *omnia.*
Sublata
Neque Fame, neque Ferro, neque Veneno,
Sed omnibus.

Nec Cœlo, nec Aquis, nec Terris,
Sed ubique jacet.
Lucius Agatho Priſcius,
Nec Maritus, Amator, nec Neceſſarius,
Neque mœrens, neque gaudens, neque flens,
Hanc
Nec Molem, nec Pyramidem, nec Sepulchrum,
Sed *omnia*.
Scit et neſcit quid poſuerit.
Hoc eſt *Sepulchrum* intus Cadaver non habens,
Hoc eſt Cadaver, Sepulchrum extra non habens,
Sed Cadaver idem eſt, et Sepulchrum ſibi.

NEW ÆNIGMAS for the YEAR 1763.

I. Ænigma 129. *By Mr.* Thomas Sadler.

SAY what I am, who never did appear
Within *Palladium* — till this preſent Year:
When Lovers meet within the ſhady Grove,
And paſs each Hour with am'rous Tales of Love,
As *Damon* claſps the lovely Maid around,
So with my Lover I am often found.
As to my *Stature*, ſometimes I am tall,
And Legs I have — my Body is but ſmall;
Arms I have many; Ladies, you muſt know
Whene'er I move I on my Belly go,
Upon the Ground I creep within the Vale,
And Rocks and Mountains I am known to ſcale;
Oftimes, ye fair Ones, many a ſturdy Blade
I have confin'd, and many a Pris'ner made;
'Mongſt *Greeks* and *Romans* I have been renown'd,
One of their heathen Deities I've crown'd;
In frantic Order did with me rejoice,
In long Proceſſion ecchoing their Voice;
In divers Parts of *England* I am ſeen,
At Church and Play-houſe I have likewiſe been.
Propitious Fair, from hence my Name infer,
And you'll oblige your Servant *T. Sadler*.

II. Ænigma 130. *By the* Same.

WITHIN the *Woods*, where Birds enchant their Song,
Two diff'rent Parts of me did once belong;
The other two which do my Shape compoſe,
From *Quadrupeds* and Mother Earth aroſe;
By Man I'm form'd to be his humble Slave;
Both Poor and Rich do my Aſſiſtance crave:
When Crops in Plenty crown the fertile Land,
Then I'm the Ruſtic's Servant at Command;
Upon the Farmer oftentimes attend,
And *Hodge* the *Miller* yearly do befriend.

With *Thomas Eaton* I hard Labour bear;
A Summer's Day gives each an equal Share:
Th' induſtrious Men my Service highly prize,
But th' Indolent my Company deſpiſe.
Perhaps, ye Fair, you'll think my Valour great,
For, Champion-like, a valiant Knight I beat.
From theſe looſe Hints the Miſt you'll ſoon diſpel,
I'll ſay no more — ſo charming Nymphs farewel.

III. ÆNIGMA 131. *By the* Same.

A Body I, but neither Head, or Eyes,
Or Arms, have got; which may, perhaps, ſurpriſe;
To raiſe your Wonder, *Ladies*, you will find,
I'm *bump'd* before, and likewiſe *bump'd* behind;
And Cripple like, a bandy Leg, you'll ſee,
Deform'd and crooked, does belong to me.
Which ſhould I loſe, by any Scene of Woe,
My Body ſtrait will into *Nothing* go.

IV. ÆNIGMA 132. *By Mr.* John Clark, *of* Lincoln.

A Living Creature to your View appears,
Which I've not lately done for many Years;
But ſuch a Creature, both in Shape and Kind,
The lovely Fair will ſcarcely ever find.
To four *Quadrupeds* I am near ally'd,
What tempted *Eve* through Inſolence and Pride,
A Bird that's ſaid to ſoar the neareſt Heaven,
A Scorpion next, to make it Number Seven.
Some Part of theſe you in my Form may ſee,
So moſt of modern Natur'liſts agree.

V. ÆNIGMA 133. *By the* Same.

WITHOUT your Leave, dear Ladies, I appear,
And often ſtrike you with a deadly Fear;
Sometimes I come upon you by Surprize,
Your Cheeks I kiſs and oft ſalute your Eyes.
When *Hodge* and *Dolly* ſeek the *ſylvan* Grove,
To hear the Birds chaunt forth their Songs of Love;
I and my Brother with an angry Frown
Can in an Inſtant ſtrike the *Culprit* down.
In various Forms in ſeveral Places ſeen,
Aloft in Air! along the verdant Green;
Philoſophers define my Name to be
In Nature like to *Electricity*.
Angles I form, obtuſe, and oft acute;
A thouſand Shapes by ſev'ral Motions ſuit.
I'm here, I'm there, — to ev'ry Place I've flown,
And viſit Worlds to Mortals yet unknown.

VI. ÆNIGMA 134. *By Mr.* William Swift, *of* Stow.

I Pleaſe the King, the Peaſant, and the Clown,
And am well known in City, Camp, and Town;
Four Feet I have, *yet* ſeldom known to walk,
A Head I've got, but have no Tongue to talk;

One Half the Year almoſt, with leaden Wand,
Death's elder Brother does o'er me command:
But ſometimes he to active Love gives Place,
Who makes me fruitful with his warm Embrace.

*** *Whoever ſends the beſt Anſwers to the following Ænigma before* March 1, 1763, *has a Chance by Lot for* 5 *and* 3 Palladiums, *of* 1s 6d *each.*

Prize-Ænigma. *By* French Johnſon, *of* Kirton, *near* Boſton.

Monſtrum horrendum!

FROM pinching Climates or the frozen Earth,
A Monſter comes — a Mountain brought me forth;
Not in the frightful Form I'm always ſeen,
The Marſh traverſing, Fen, or flow'ry Green,
Or Champain, Hill, or Vale, and where the Plough
Turns up the Soil — for ev'ry where I go.
There in full Length inſultingly I brave
The *Greenland* Monarch wrapt in icy Wave,
The Alligator, or the Spawn of *Nile*,
Whoſe Cries alluring Travellers beguile.
So Fame reports — and thus the Poets feign
Diluvian *Python* and the Hydra ſlain.
A Dragon watchful with peculiar Care,
And ſnaky Ringlets of *Meduſa*'s Hair.
So much for hideous Forms and flaming Eyes,
Of pois'nous Nature and enormous Size."—
Coil'd up in various Forms I wait the Light,
For ſuch my Nature, I ne'er move by Night:
No ſooner view the orient Lamp of Day,
Than from ſecure Retreat I ſtretch my Way;
In Form ambiguous know ye I partake
Of *Amphiſbæna* and the Rattle-Snake;
Advancing forward, backward I oft reach,
Like ratling Serpent, with a Head at each;
In Sun-ſhine baſking, there my Back behold,
As pois'nous Adders, ſeems emboſs'd with Gold.
Severe the Curſe, yet that Decree were juſt,
A crawling Reptile I too lick the Duſt.
Am mild by Nature, yet it muſt be ſaid
I'm always driven, yet am always led.
On Man's Occaſions, by Land-Owners forc'd,
By Farmer hated, by the Grazier curs'd.
My Kindred vary in their State and Show,
The Height of Grandeur and the Depth of Woe.
I ſhape a Kingdom — claim with juſt Pretence,
A lib'ral Science in the ſtricteſt Senſe.

The

The QUERIST.

NEW QUERIES.

I. QUERE 145. *By Mr.* P. Antrobus, *at* Great Budworth, *in* Cheſhire.

WHY is Man ſo much *irritated* at being called a *Liar*, and at being told he lies, more than at any other equal Affront or Reproach.

II. QUERE 146. *By the ſame Gentleman.*

WE ſee very often Men marry to Women of different Religions from themſelves; who, before they are married, pretend great *Love* and *Obedience*; yet afterwards will not alter their Religion agreeable to that of their Huſband; what Reaſon can be aſſigned for it? and what are the *beſt* Means to bring theſe Women over?

III. QUERE 147. *By Mr.* Thomas Sadler.

WHY ſome *fixed Stars* appear conſtantly *fiery*, and others conſtantly *pale*?

IV. QUERE 148. *By Mr.* Thomas Ford, *of* Stow School.

WHY do the *Liquors* in the *Eye-ball* never *freeze*?

V. QUERE 149. *By a* Naturaliſt.

WHAT is probably the chief Uſe of conſtant ſubterraneous Fires, and what will be the final Effects thereof?

VI. QUERE 150. *By* Amanda.

WHAT Method is likely to recover Life and has recovered it, in a Perſon who has been drowned for ſometime, having neither Senſe nor Motion?

*** *Whoever ſends the beſt Anſwers to the following* Quere *before* March *the 1ſt next, has a Chance by Lot for* 3 *and* 2 Palladiums *of the enlarged Plan.*

PRIZE-QUERE. *By* Publicus.

WHAT is the beſt and ſureſt *Remedy* for a *Kentiſh* Ague?

☞ The *Gentleman* who required the *Cauſes* of the different coloured Spots, by the Galling of the Saddle, on different coloured Horſes Backs, might as properly have required the *Cauſes* of the different coloured *Hairs* of thoſe Horſes, and would as ſoon be anſwered

Mr. *Locke*, in his *Chapter* of the *Extent of Knowledge*, ſhews Mankind where to ſtop their Enquiries, and at what *Bounds* to ſtand; *viz.* at where we have no *Ideas*; for there we can have no *Knowledge*.

NEW REBUSES.

I. REBUS. *By Mr.* John Clark, *of* Lincoln.

A Queen who ſat on *England*'s Throne,
A *Chriſtian* Name, in ſhort, ſet down;
A Part belonging to a Man;
Now join theſe proper if you can:
Then you a *Name* will find with Eaſe,
Of one whoſe ſurely form'd to pleaſe.

II. REBUS. *By Mr.* J. Knowles, *of* Epſom.

THREE fourths what ſurrounds a well fortified Town,
With the greateſt of *Weights*, next in Order, ſet down;
Theſe added together, a Place you'll diſcover,
Where's a Bridge for its Beauty, fam'd all the Land over.

III. REBUS. *By the ſame* Gentleman.

A *Bird* that's ſtil'd *King*, as the Antients do feign,
To which add a *God* that preſides o'er the Plain;
And what's the Defence of great *Albion*'s Land
From the Inſults of *France* and her treach'rous Band;
With the Name of a Fruit that's *Iberia*'s Pride,
And that of a *Planet* which ruleth the Tide;
Their *Initials* connected, or properly join'd,
Will ſhew you a Village — where Laſſes are kind.

NEW PARADOXES.

I. *Aſtronomical* PARADOX, *By the* AUTHOR *of the* Royal Aſtronomer and Navigator.

THERE are three remarkable *Places* in the Iſland of *Great-Britain*, having a fair and open Horizon, at each of which Places, the Moon neither *riſes*, *ſouths*, or *ſets*, on 3 certain Days, in each Month of the Year; and that in a *plain* and *literal* Senſe, without any *Ambiguity* or Equivocation, *in Terms*, whatſoever.

II. PARADOX. *By Mr.* P. Antrobus.

YE *Artiſts*, pray diſcloſe,
How I *ten* Trees may ſo diſpoſe,
In *fifteen* Rows, nor more;
And each contain juſt *four*.

NEW QUESTIONS.

I. QUESTION 232. *By Mr.* P. Antrobus.

REQUIRED the *leaſt* whole Number, which being divided by 50, 28, and 19 reſpectively, there ſhall 16, 9, and 1, reſpectively remain? Propoſed in *Lond. Mag.* ſome Years ago, but never anſwered.

II.

II. QUESTION 233. *By Mr.* William Chapman, *of* Foxton, Leiceſterſhire.

REQUIRED all the different Ways that 120 *l.* can be payed in 18 *Shilling* and *Guinea* Pieces?

III. QUESTION 234. *By Mr.* Alexander Rowe, *of* Reginnis, Cornwall.

A young Lady has an Ingot of Silver for her Fortune, in the Form of a *Wedge*, whoſe *Axis* or Length = 16, Breadth = 9, and Depth = 6 Inches. From whence ſhe is deſirous to know the Solidity of this *Wedge*, and how much her Fortune is in Pounds *Sterling*; the Silver of which the Wedge is compoſed being worth 5 Shillings *per* Ounce?

IV. QUESTION 235. *By the ſame* Gentleman.

REQUIRED the Time that a Ship will take to ſail to the Iſland of *Barbadoes* in the *Weſt Indies*, from the *Lizard* Point in the Weſt of *England*, at the Rate of 200 Engliſh *Leagues per* Week, on a direct Courſe?

V. QUESTION 236. *By the* Same.

MY Eye being 5 Feet above the horizontal Plain, I took the Angle of Elevation of a diſtant Tower = 24° 30′; walking directly forward towards it 54 Feet, I found the Angle of Elevation = *twice* the firſt; going farther on, I found the Angle of Elevation equal to *thrice* the firſt; whence the Tower's Altitude is required.

VI. QUESTION 237. *By Mr.* Thomas Holland, *of* Marbury.

A Farmer, going to buy Cattle at a Fair, had 120 *l.* in two ſeparate Bags; who being attacked by a *Highwayman* that demanded his Money, he delivered one of his Bags of the leſs Value; and if you multiply the *Cube* of the Pounds in the remaining Bag by the *Square* of the Pounds in the Bag delivered, the *Product* will be the *greateſt poſſible* of any from two different Sums, in Pounds, the Farmer could have divided his Money, *viz.* 120 *l.* into. *Required* from thence the Pounds had of him by the Highwayman, and what remained in the Farmer's Poſſeſſion.

VII. QUESTION 238. *By the ſame* Gentleman.

REQUIRED the *Dates* of the Year, in which a Father and his two Sons were born; the Father's being equal to the two Sons Ages; expreſſed by theſe two Equations,

$$\left.\begin{array}{l} x^2+y^2+x+y=2538 \\ xy+x+y=1286 \end{array}\right\} \begin{array}{l} x \text{ and } y = \text{Sons} \\ \quad\text{Ages.} \end{array}$$

VIII. QUESTION 239. *By Mr.* John Clark, *of* Lincoln.

TO determine the Value of x, from the Principles of *Algebra*, when $\dfrac{ax^4-x^5}{3x+a}$ is a *Maximum*.

IX. QUESTION 240. *By Mr.* Thomas Ford, *of* Stow-School, Lincolnſhire.

A Father dying left betwixt his two Sons 2450 *l.* the Difference of their Shares when ſquared is equal to 379750 *l.* *Quere* their Shares?

X. QUESTION 241. *By Mr.* William Taylor, *of* Eckington, Derbyſhire.

GIVEN the three Diſtances, from the three Corners of an *Iſoſceles* triangled Field to a *Windmill* ſtanding in an open Common, 51, 27, and 51 *Chains* in ſucceſſive Order, alſo the Diameter of the Fields inſcribed Circle = 16 *Chains*. Required, from thence, the Content and Sides of the Field?

XI. QUESTION 242. *By Mr.* P. Antrobus.

A Gentleman has a Field in the Form of an Ellipſis, whoſe conjugate Diameter is 30 Chains, and Tranſverſe 40 Chains. At the Extreme of the conjugate Diameter is a Pond, from which the *Owner* would have a Fence drawn to the oppoſite Part of the elliptic Boundary, ſo as to cut off exactly one *Third* of the Ellipſis. Required, from thence, the Length of the ſaid Fence, and Value of the Field at 2 *l.* 10 *s.* *per* Acre.

XII. QUESTION 243. *By Mr.* Edward Johnſon, *of* Hull.

THERE is a *Cylinder* whoſe Length is 5 Feet, and Baſe Diameter = 18 Inches. It is required to cut the ſaid Cylinder into two Parts, by a Plane paſſing through one End of the Baſe Diameter, ſo that the *greater* Part placed with its Section upon a horizontal Plane ſhall but juſt ſupport itſelf from falling.

XIII. QUESTION 244. *By the ſame* Gentleman.

A Ship is bound to a *Port* which bears NE*b*N, diſtant 64 Leagues, and meets with the Wind at N*b*W, and a *Current* that ſets NW, 2 Miles *per* Hour; ſhe lies within 68 Degrees of the Wind, and ſails at the Rate of 5 Miles *per* Hour by the Log, how far muſt ſhe ſail upon each Tack, to gain her deſired Port?

XIV. QUESTION 245. *By the Same.*

REQUIRED the two leaſt nonquadrate Numbers x and y, ſuch that $xx+yy=\square$, and $x^3+y^3=\square$.

XV. QUESTION 246. *By Mr.* William Chapman, *of* Foxton, Leiceſterſhire.

THREE Ships, A, B, C, ſent from a certain Port in N. Latitude until they arrive at three different *Ports*, all lying under one Parallel in one Degree of South Latitude; A ſailed a *direct* Courſe between the South and Weſt 90 Leagues; C ſailed 90 Leagues between the *South* and the *Eaſt*; B ſailed a Courſe between A and C 60 Leagues; when the Diſtance between A and B, and B and C, are as 3 to 4. *Required* from thence the Diſtance of each Ship from the other, the *Courſe* ſailed by each, and the Latitude of the Port they all ſailed from, with the Longitude of the Ports they arrived at?

XVI. QUESTION 247. *By Mr.* THOMAS MARSHAL, *of* Blenchland, *near* Hexham.

REQUIRED the Days of the Month, and Week-day, on which the *New* and *Full* Moons happened in *March* 3652 before *Chriſt*; and alſo the *Epacts* for that Year; both according to *New* and *Old* Style?

XVII. QUESTION 248. *By the ſame Gentleman.*

A Lady was born in the Year of *Chriſt*, when the *Golden Number* was 10, Cycle of the *Sun* 5, and *Roman Indiction* 1, required her Age in 1763.

XVIII. QUESTION 249. *By Mr.* Alexander Rowe.

GIVEN the Abſciſſa of a conic *Parabola* = 30, and its correſponding Semiordinate 40, *required* from thence the Dimenſions and Area of the greateſt inſcribed *Parallelogram.*

XIX. QUESTION 250. *By Mr.* Thomas Marſhall, *of* Blenchland.

REQUIRED how much *Money* muſt be paid in equal *weekly* Payments, for four Years together, to diſcharge a Debt of 100 *l.* the Creditor allowing compound *Intereſt* to the *Debtor* for each preſent Payment of his, to the End of the ſaid Time?

XX. QUESTION 251. *By the ſame.*

TO determine the moſt eaſily all the Times of *Conjunction* and *Oppoſition,* of the Hour and Minute Hands of a Watch, during one Revolution of the *Hour* Hand.

XXI. QUESTION 252. *By* Americanus.

IN what Latitude is the *ſhorteſt* Day equal to half the *longeſt*?

XXII. QUESTION 253. *By* Analyticus.

WHAT is the Time in the Morning, when $\frac{3}{8}$ from Noon, is equal to $\frac{4}{5}$ from Midnight?

XXIII. QUESTION 254. *By Mr.* T. Marſhall.

ON what Year following does a *New Moon* next happen on the 25th of *December,* N. S.?

XXIV. QUESTION 255. *By* M. B.

IN the Equation $x^x - x - l.x = 110$, *required* the Value of x, where $l.x$ denotes the *Hyp. Log*, x.

XXV. QUESTION 256. *By* Cheſterfieldienſis.

TO find the Dimenſions and Solidity of the *greateſt* Cylinder that can be cut out of a *Cone* whoſe Altitude is 50, and Diameter at the Baſe 40 Inches.

XXVI. QUESTION 257. *By Mr.* Thomas Sadler.

UPON the Day of *Royal* Coronation,
When GEORGE and CHARLOTTE joy'd this happy Nation,
At *Audlem* Village, erected you might ſee,
A ſtately *May-Pole*, near a ſpreading *Tree*;
Where Crowds attending round them then were ſeen,
Who freely drank a Health to KING and QUEEN.
The *May-Pole*'s Height, and *Tree*'s, if you would know,
You'll find them from the *Data** plac'd below.

* *At the Corner of a Houſe,* 100 *Yards from the Foot of the* May-pole, *I took its Angle of Altitude* 10° 12′ *over the Top of an* Elm-Tree; *My Diſtance from the Foot of the Tree was the*

greateſt *poſſible of any other the Tree could be placed in,* on *that Condition.*

XXVII. Question 258. *By the ſame.*

BEING in the Fields near *Norbury*, when it was very calm, I heard the Sound of the Church-Clock at *Wrenbury*, bearing NE, and ſoon after I heard the Sound of *Marbury* Church-Clock ſtrike, bearing SE; the Bells of each Church being of an equal *Size*, and the *Intenſity* of the firſt Sound, as near as I could diſtinguiſh, to the laſt, was in the *Ratio* of 3 to 5; the Diſtance between the two Towns is 2 *Miles*: Required, from thence, how far diſtant I was from each Town.

XXVIII. Question 259. *By Miſs* Podmore, *of* Marbury, Cheſhire.

IN *Cheſhire* now where aged Ruins lie,
Down the *ſlant* Rock of *Beeſton Caſtle*, I
A Stone let fall; the Time it took was found
Eight Seconds, e'er it reach'd the level Ground.
From which Conditions, *Artiſts*, let me ſee
The Rock's true Height, the *greateſt* that can be.

N. B. *The Caſtle's Height is* = 229,12 *Yards.*

⁂ *Whoever truly anſwers the following Queſtion by the 1ſt of* March *next, has a Chance, by Lot, to win* 8 Palladiums *of the enlarged Plan, being equal in Value to* 12 *of the former Plan.*

Prize-Question. *By the* Author *of the* Royal Aſtronomer and Navigator.

THE *Prize-Money* ſhared by a *Captain* of a *Man of War*, is equal to

$$\frac{x\sqrt[3]{9a^3 - x^3:} - 2ax}{a - \sqrt[3]{ax^2}}$$

Pounds Sterling; where $x = a = 100000$ *l.* *Required* the Sterling Pounds of that *Prize-Money*. With a *general Method* of ſolving all Queſtions of the like Nature, where, by ſuppoſing the *variable* Quantity *x*, equal to the known Quantity *a*, the Value of the *Numerator* and *Denominator* vaniſhes; yet the *Fraction* ſhall, in ſuch Caſes, have a determinate Value, by a Property in *Analytics* demonſtrably true.

ANSWERS to the ÆNIGMAS for 1762.

I. A Weathercock.
II. A Name.
III. The Back.
IV. A Pair of Compasses.
V. A Sickle.
VI. The Eyes.
VII. Tea Tongs.
VIII. Letter V.
IX. Rain.
X. A Salamander.
XI. Bagpipes.
XII. A Mask.

XIII. A HECKLE, HATCHEL, or FLAX-COMB.
XV. The PALLADIUM. Prize. A SIGN.
XIV. A HAY or CORN-RICK.

Mr. *William Chapman*, of *Foxton*, *Leiceſterſhire*, anſwered all the Ænigmas.

The PRIZE-ÆNIGMA *anſwered by Mr.* John Clark, *of* Lincoln.

I would endeavour, Sir, to win your *Prize*,
Yet doubtful of theſe vain Efforts of mine,
But yet what Man can tell until he tries,
If *Fortune* will give him the lucky SIGN.

The ingenious Mr. *Thomas Walker* of *Colnbridge*, near *Huddersfield*, *Yorkſhire*, ſent us an Anſwer to the *Prize-Ænigma* in Verſe, of *Damon*'s Complaint, for being forced to leave his charming *Cloe*.

Mr. William Swift, *of* Stow, *anſwers the* PRIZE-ÆNIGMA *thus.*

SOME ſay the Zodiac Conſtellations
Have long ſince chang'd their Situations
Above a SIGN, and prove the ſame
In *Taurus* now, once in the *Ram*. *Hudibras.*

Mr. *Thomas Holland* anſwered the ſame in Verſe, as he did all the *Ænigmas*. Mr. *Knowles* anſwered the *Prize*, as did Mr. *John Buddle*, of *Cheſter-le-Street*, and all the Ænigmas. Mr. *Thomas Marſhall* anſwered the *Prize*; as did Mr. *Alexander Rowe* in Verſe.

Mr. William Swift, *of* Stow, *anſwers all the* Ænigmas *thus.*

I court, *Sir*, a Miſtreſs who has but one EYE, 6.
She's crooked as SICKLE, and will not comply; 5.
She varies as WEATHERCOCK, COMPASS, or RAIN, 1. 4. 9.
Which makes me afraid that I can't her obtain.
But, if I ſucceed, Sir, the BAGPIPES ſhall play, 11.
And I'll dance round the CORN-RICKS like *Fairies* in *May*. 14.
But leſt from the ALPHABET I can't contrive, 8.
Perſuaſions to make her my Spirits revive;
I'll make her a Preſent of TEA-TONGS and MASK, 7. 12.
As ſhe has a good NAME, Sir, no more will I aſk. 2.
She, like SALAMANDER, ſhall kindle Love's Fire, 10.
I'll SIGN her Decree; and if more ſhe require, *Prize.*
To her Thouſand ſtring'd *Harp* I will bow up my FIDDLE! 3.
Such *Muſic* in Concert — will anſwer the Riddle.
She's as ſharp as a HECKLE — of a *Daffodil* Smell; 13. 15.
And though ſubject to ſcold — ſhe's as ſound as a *Bell*.

Anſwers to all the ÆNIGMAS *by* Jacas de Epſom.

I late was aſk'd by a Fair Lady
My Sentiments of *Prize-Palladie*; 15.
Then thus in brief I did reply,
It muſt reſemble V or I; 8. 6.
'Tis like a Harp, 'tis like a *Heckle*, 13.
'Tis like a *Haycock*, like a *Sickle*, 14. 5.
'Tis like a *Maſk*, 'tis like the *Rain*, 12. 9.
'Tis like a *Tongue* none can reſtrain, 7.
'Tis like a *Creature* bred in Fire, 10.
Or *Gallus* mounted on a Spire; 1.

'Tis like *Dividers*, like a *Flail*, 4.
Or like the *French* when they turn *Tail*. 3.
'Tis like a *Bagpipe*, or a Fiddle, 11.
Or what we want to ſolve the *Riddle*. 2.
He that the whole can truly anſwer,
May fairly paſs for *Necromancer*.
So like a Tale of Witch, or Fairies,
Adieu Ma'm'ſelle, till Sol's in *Aries*. *Prize.*

Mr. *Iſaac Tarrat*, of *Epſom*, anſwered all the *Ænigmas*. Mr. *Tho. Ford*, of *Stow* School, anſwered the *Prize-Ænigma* in Verſe.

Mr. *G. Hayden*, of *Hertford-College, Oxford*, anſwered all the *Ænigmas, Rebuſes*, and *Paradoxes*, in Proſe, and the *Prize-Ænigma, Rebuſes*, and *Paradoxes*, in Verſe. — This Gentleman informs us, that Mr. *Knowles*'s *Queries* are old and borrowed, *viz.* that of *Pain* or *Pleaſure* was from the *Athenian* Oracle, *Vol.* 2. The other from the *Philoſophical Tranſactions*, where the ſame *Query* is proved to be falſe, and the *Fiſh* to have no ſuch *Phænomena* as is inſerted in the *Palladium* for 1762, he ſays.

Likewiſe, that the ſecond Rebus is taken *verbatim* from the *Traveller's Magazine*.

Mr. *Knowles* has nevertheleſs anſwered all the *Ænigmas*, and *Paradoxes*, in Proſe, and the firſt *Rebus*, concerning Miſs *Brown*, in Verſe.

Mr. *William Swift*, of *Stow*, has humourouſly anſwered all the Ænigmas in a Love Letter from *Jack Doolittle* to Miſs *Woodbine* of *Oakham*. — Who has given the three Maidens and Bride and Bridegroom's Ages in *Pindarics*, in Anſwer to the 1ſt and 22d Queſtions.

☞ Jacas de Epſom *won the* 3, Monimia *and* Amelia *(whoſe Anſwers are too long to inſert) the* 2 *and* 1 Prize Palladiums *of the enlarged Plan : being equal to* 9 *on the former Plan.*

ANSWERS *to the* QUERIES *in the* PALLADIUM, 1762.

I. QUERE 132, *anſwered by* P. Antrobus, *Maſter of the Grammar-School at* Great Budworth, Cheſhire.

ABSALOM's Hair, which he yearly polled, was two hundred *Shekels*, which, according to the *King*'s Weight, was Half an Ounce to the *Shekel*; and comes to 6 Pounds 4 Ounces *Avoirdupoize*, or 8 Pounds 4 Ounces *Troy*, the Weight of the Hair.

Mr. *Chr. Cave*, of *Harpſwell*, ſays, that the King's Weight being the Standard, or *Shekel* of the Sanctuary, (*Exod.* xxx. 13.) it appears that *Abſalom*'s Hair weighed 6 lb. 4 oz. *Avoirdupoize*, or 7 lb. 5 dwts. *Troy*, agreeing with the former *Anſwer*.

The ſame anſwered by Mr. Lyon, *of* Margate, Kent.

ACCORDING to the Biſhop of *Peterborough*'s *Tables*, the *Shekel* was 4 dwts. 13 gr. Whence, 200 Shekels amount to 3 lb. 9 oz. 8 dwts. 8 gr. *Troy*, and 3 lb. 1 oz. 10 dwts. $\frac{1}{4}$, *Avoirdupoize*, the Weight of *Abſalom*'s Hair,

Mr.

Mr. Thomas Huntley's *diſtinguiſhed Anſwer.*

THERE are two Sorts of *Shekels*, the common *Shekel*, and the *Shekel* of the *Sanctuary*; the one appropriated to *civil*, the other to *religious* Uſes. The *Shekel* of the Sanctuary is ſaid to be double in Weight and Value to the common *Shekel*, and juſt $\frac{4}{7}$ of the *Roman Uncia*, which *Uncia* Dr. *Arbuthnot* makes to weigh 438 Grains Troy.

Therefore, $438 \times \frac{4}{7 \times 2}$ or $125\frac{1}{7}$ Grains is the Weight of 1 common *Shekel*, which × 200, the Number of *Shekels*, after the King's Weight, (implying they were the common *Shekels*) gives $25028\frac{4}{7}$ Grains; and reduced is 4 lb. 4 oz. 2 dwts. 20 gr. $\frac{4}{7}$, *Troy*. And by this Proportion, *viz.* as 14 oz. 11 dwts. 15 gr. $\frac{1}{2}$, *Troy* : 256 dwts. :: 4 lb. 4 oz. 2 dwts. 20 gr. $\frac{4}{7}$: correſponding Weight *Avoirdupoize* 3 lb. 9 oz. 3 dwts. ,4, required.

Mr. *Thomas Walker* makes the Weight of *Abſalom*'s Hair, or 200 *Shekels*, after the King's Weight, to be 45 oz. 12 gr. $\frac{1}{2}$ at 4 dwts. $13\frac{1}{2}$ Grains; each, being (as he obſerves) Half the other *Shekel* of twice the Weight, or 9 dwts. 3 gr. — Who alſo obſerves that ſome *Women* have not leſs than 32 oz. of *Hair on their Heads only*.

II. QUERE 133, *anſwered by* P. Antrobus.

THE *Rainbow* the *Hebrews* call קשת אלהים, the Bow of GOD. This *Phænomenon* is ſeen in the falling Rain or Dew, and not in the Cloud, whence that Rain or Dew proceeds; it is cauſed by the *Reflection* and *Refraction* of the Sun's Rays from the globular Particles of Rain, (ſee *Newton*'s *Optics*) and is repreſented in a philoſophical Experiment.

Mr. *Alexander Rowe* obſerves, that the *Poet* appeals, in this Place, (as well as in many others of his Works) to the greateſt Artiſts on Earth, for Operations of their Kind, to compare with that noble *Bow*. — Who ſets this *high Inſtance* of Nature infinitely beyond the beſt Production of Art.

He thence leads up to him that ſitteth in the Heavens; who is the *Great Maker* and Director of all Things; though inviſible to us but from his Works of Creation.

III. QUERE 134, *anſwered by Mr.* Thomas Walker.

IT is a known *Law* in *Optics*, that every Object whoſe Image is reflected by a *Mirror*, or ſmooth Surface, appears at the ſame Diſtance behind the reflecting Surface, as the *Object* is placed before it: Conſequently, if a Man is placed upon the Margin of a Brook, or ſtanding Pool of Water, with his Head erect, his Image muſt appear inverted below the Water, as his Head is placed at the greateſt Diſtance from its Surface, which reflects the Image.

The ſame will alſo hold with reſpect to Trees, Houſes, or whatever elſe is viewed in Water.

Mr. Thomas Huntley *anſwers it after this Manner.*

THE *optic* Writers demonſtrate, that in a plain *Speculum* or *Mirror*, the Image of any radiant Point is ſeen in that Place where the reflected Ray paſſing through the Center of the Eye meets the *Perpen-*

dicular let fall from the radiant Point upon the *Speculum*; from which ſingle Propoſition this Quere is eaſily reſolved. — Who rationally proceeded by a Figure, to ſhew the *Particulars*, for which we refer the Reader to *Newton*'s Optics,

IV. Quere 135, *anſwered by Mr.* Alexander Rowe, *of* Reginnis, Cornwall.

THE Reaſon aſſigned for this *admirable* Effect is, the *inſtantaneous* Action of a Multitude of muſcular Parts on the Surface of the Fiſh's Body. — But we find ſome Land Animals *electric per ſe*, and there may therefore be *aqueous* ones having that Property. This Fiſh may be one of that Kind, that when it is touched by the Finger out of the Water, ſtrongly *electrifies* the Perſon who touches it. Hence the electrical Power and joint Force of its muſcular Parts, are ſufficient to account for the ſurpriſing *Phænomenon* or Effect.

The ſame anſwered by Mr. Thomas Huntley.

THE natural Philoſophers tell us, that the Qualities of Bodies, their Powers and Operations on each other, proceed from the different *Magnitude*, *Figure*, *Texture*, *Poſition* of *Motion* of the conſtituent Particles. — Hence, it is judged, that when the Finger touches the *Torpedo*, the *Effluvia* emitted from the Body of that Fiſh penetrate the Pores of the Skin, and excites a Senſation ſimilar to the *Cramp*, attended with an *inſtantaneous* Shock, like that of Electricity. — It is however to be obſerved, that the particular Manner of the Operation is not diſcoverable by us; for, as the *Palladium-Author* juſtly remarked in laſt Year's *Palladium*, *we are ignorant of the original and conſtituent Parts of Matter, and can only underſtand its Qualities by Obſervation and Experiment.*

V. Quere 136, *anſwered by Mr.* Alexander Rowe.

PLEASURE may be reſiſted by *Reaſon*, though with Reluctance; but *Pain* cannot. However the Energy of Nature and the Power of *Medicine* ſometimes aſſuage *Pain*.

Remark. The different *Ideas* annexed to the Words *Pleaſure* and *Pain*, occaſion Diverſity of Anſwers to this Quere.

Anſwer to the ſame by Mr. Chr. Cave.

THERE is but one *ſubſtantial Pleaſure* in Life, namely our Duty to *God* and Man. If the ſuperior Number of thoſe who *more eaſily* reſiſt or withſtand this *true Pleaſure*, conſidered as a *Pain* to them, and leſs eaſily reſiſt, or more eaſily purſue, the *contrary* to their Duty, *viz.* *vain Pleaſure*, or *real Pain*, in Conſequence, be true, the Quere is anſwered.

Remark. This Anſwer is by defining *Pleaſure* and *Pain* in a different Senſe to what thoſe Words *uſually* import; making the Anſwer depend on the *equivocal* Signification of Words.

Mr. *John Clark*, of *Lincoln*, alſo obſerves, that *Pain*, conſidered as Duty of human Life, is *more eaſily* reſiſted or withſtood than vain *Pleaſure*. That the *latter* inſenſibly ſteals into the Heart like ſubtle Poiſon; and that Experience ſhews, when once it has taken Poſſeſſion it is as hard to extract as a bearded and poiſoned Dart. — Who farther obſerves that the Archbiſhop of *Cambray*, in his excellent Adventures of *Telemachus*, in the *Iſland* of *Cyprus*, has given a lively Deſcription of the Danger of Pleaſure. — He ſent us a Quotation, in *French*, from that famous Writer (we have not Room for,) ſhewing how difficult a Thing it is for a Man to reſiſt the *Pleaſures of Senſe* in the Prime of his Life. — Our Correſpondent remarks, that though we may, with Patience, uſe ourſelves to bear *Pain*, in Hopes of future Reward; yet it ſhews (he ſays) that *Pleaſure* has the greater Aſcendancy over us, and is the *leſs eaſy* to reſiſt, and conſequently *Pain*, as our Duty, is reſiſted the *more eaſily*.

Mr. *G. Hayden*, of *Biſhopſton*, near *Sarum*, juſtly diſtinguiſhes between bodily and intellectual *Pleaſure* and *Pain*, conſidered as *Good* and *Evil* to us; the former as eligible and deſirable; and the latter as pernicious and odious, in Conſequence. — That therefore the *Good*, or ſubſtantial *Pleaſure*, ought to be *embraced*, and the *Evil*, Pain, or pernicious *Pleaſure*, ſhould be reſiſted or rejected as much as poſſible.

That, in the human Frailty, *vicious Pleaſures*, which are the *Baits* of Senſe, are *leſs eaſily* reſiſted or withſtood, than that which is *Good* for our Happineſs; attended with *more Eaſe* to reſiſt or avoid, and with *more Difficulty* to obtain. In which Senſe (he ſays) we can *more eaſily* avoid or reſiſt *Pain*, oppoſing us in doing as we ought for our *Health* and laſting *Peace*, than we can reſiſt or withſtand *Pleaſure*, gaining the *Aſcendancy over us*, and attracting us with its Power and Allurements.

Diſtinction by the Author. Standing betwixt *Pleaſure* and *Pain*, two *Adverſaries* of oppoſite Qualities to each other, if my Senſes are more attracted by what I conſider as *Pleaſure* than by what I conſider as *Pain*, I ſhall find it *more eaſy* to reſiſt or avoid *Pain* than *Pleaſure*, in the common Acceptation, and not *equivocal* Meaning, of thoſe *Terms*: For, it will be always the *more eaſy* to *ſhun* or *reſiſt* the leſs potent of two Powers exerciſing their Influence over us. — But *Pleaſure* or *Pain* (whether of *Body* or *Mind*) being upon us, we can *more eaſily* endure the former than latter; but have no Power at all to reſiſt the *Effect* or *Force* of either then preſent to our Senſes; and therefore preſent *Pleaſure* and *Pain* are, in that Caſe, *equally reſiſtable*, *i. e.* not at all.

VI. QUERE 137, *anſwered by Mr.* P. Antrobus.

PRIMOGENIAL Light conſiſts in a certain Motion of the Particles of *luminous* Bodies, which force out and from the ſaid Bodies certain exceeding and inconceivably ſmall Particles, which, with incredible Force, are, every Way, emitted in *ſtrait Lines*. And *derivative* Light conſiſts not in an Endeavour to Motion; but in a *real* Motion of thoſe *Particles* emitted from Bodies.

Mr. *Geo Hayden*, of *Biſhopſton*, near *Sarum*, refers the *Queriſt*, for a full Explanation of the glorious Properties of Light, to Mr. *Catcott*'s *Veteris et veræ Philoſophiæ Principia*, P. 6. *Pike*'s *Philoſophia ſacra*, P. 91, 92. *Newton*'s *Principia*, and his *Optics*, Qu. 24. And the learned Mr. *Hutchinſon*'s *Principia*, Part 2. P. 315, & *ſeq.* *Nature diſplayed*, Vol. IV. P. 171, & *ſeq.* ſmall Edition. — Who never hearing of the Wonder, makes no Mention of the *Chatham Philoſopher*'s new Doctrine of *Whiteneſs* and *Blackneſs*, for *Light* and *Darkneſs*; excluſive of the Body of Air having to do in the Matter.

But Mr. *Geo. Hayden* has alſo applied a Philoſophy, different from the *Newtonian* — to account for the Revolution of the *Syſtem* of *planetary* Bodies about the Sun, as their Center of Motion. He ſuppoſes the Preſſure of a ſurrounding *Æther* or ſubtle Fluid, (compoſed of *Light and Spirit*) fineſt at the Center and groſſeſt at the Circumference, in a regular and increaſing Proportion; from whence, *he thinks*, that the Earth and *Planets* would be driven into the Sun, by the *outward* Preſſure, were they not withheld by *other Circumſtances*; ſuch as the Progreſſion of Light from the Sun, and Reflection thereof by the intercepting Bodies, increaſing the *Fineneſs* of the *Æther* on the Side of the Body next the Sun, and augmenting its *Groſſneſs* on the contrary Side thereof, *&c.*

But which Hypotheſis *does not account for the Suſpenſion and Revolution of thoſe Bodies.*—

He alſo *imagines* a conflicting *Ether* and *Spirit* moving in *all Directions*, by an *Emanation* and *Reflection* of the *luminous* Particles from the Sun to the obſtructing Bodies; occaſioning oppoſite Motions, *reſiſting* and *ballancing* each other mutually — *ſome Way or other.* —

But, in this *imaginary Hypotheſis*, (unſupported by Reaſon and Experience) the Revolution and Retention of the Bodies in their reſpective Orbits being *not duly accounted for, as in the Newtonian Philoſophy, this Author* (like the famous *Chatham Philoſopher*, miſreading *Barrow* on *Newton*) *ſeems to ſet aſide that Philoſophy, of the different Quantities of Matter, placed at different Diſtances, revolving by the mutual and centripetal and centrifugal Forces of Gravitation and Projection being firſt put in Motion.*

Mr. *Alexander Rowe* obſerves, that *Light* conſiſts of certain *ſubtle Particles* of Matter, of different Magnitudes and Refrangibility, capable of exciting in us the Senſation of *Colours*. Which Particles are emitted from every Point on the Surface of the luminous Body, in right Lines, and in all Directions, with unparalleled Velocity; (as they are again *reflected* from all Points of the Surface of Bodies they fall upon, in all Directions) whoſe Power, or *Intenſity* of Heat, are found to *decreaſe as the Squares of the Diſtances from the luminous Body increaſe.* — Hence, Light is found to be a *material* Subſtance, from its being propagated, in Time, and from its acting ſtrongly upon, and altering the State of, other Bodies. That its compoſing Particles are amazingly ſmall, is evinced from the greateſt Quantity of Fire or Flame being found to have little or no Weight.

The ſame anſwered by Mr. Thomas Huntley.

THE Philoſophers of Truth and Experience tell us, that *lucid* Bodies emit an *infinite* Number of very ſmall *Particles* or *Corpuſcles*, called Rays, with amazing Velocity through the circumambient Space; and that, from every lucid Point, theſe Rays (which are tinctured with all the original Colours in Nature, *viz. red, orange, yellow, green, blue, indigo*, and deep *violet*) are propagated in an Orb, and in right Lines, if the *Medium*, through which they paſs, be *homogeneal*; but if theſe Rays meet with a *Medium* of a different Denſity, whoſe Parts either repel, or diffuſe the radiant Stream more or leſs, they will ſuffer an *Inflection*; and the Science which treats of the *Laws* and *Effects* of it is divided into two Branches called *Catoptrics* and *Dioptrics*.

Theſe *Rays*, which iſſue from every Part of a *lucid* Object, fall upon the aqueous Humour of the Eye, are by it refracted to the *cryſtalline* Humour, and thence paſſing through the *vitreous* Humour, are converged and united on a fine curious Membrane, called the *Retina*; which *Impreſſion* being conveyed to the Brain by the medullary *Fibres* of the optic Nerves, preſents to the Mind the Image of the Object.

VII. QUERE 138, *anſwered by Mr.* Thomas Huntley.

AN Anima ſit ex Traduce? is a well known *Queſtion* among the School Divines. The Meaning of which I take to be, *Whether the Soul, or cogitative Part of Man, be formed as is the Body, and with the Body, by Generation?* This is one of thoſe uſeleſs and abſtruſe Queſtions, in the Diſcuſſion of which that grave Tribe of Students have in vain exerciſed their ſerious Thoughts; and the certain Knowledge of which *(and whereof we have no true or real Ideas)* the great Author of all Things has ſeen fit to conceal from us.

Anſwered by Mr. Williams, *of* Hackney.

THERE may be perhaps who will ſay, *that the Soul, together with Life, Senſe,* &c. *are propagated by Traduction from Parents to Children, from them to their Children again, and ſo from Eternity: and that therefore Nothing can be collected from the Nature of them as to the Exiſtence of a Deity*.

If there could be ſuch *Traduction*, yet to ſuppoſe one *traduced* to come from another *traduced*, and ſo *ab æterno*, without any farther Account of the Original of Mankind, or taking in any AUTHOR of this *traductive* Power, is the ſame as to ſuppoſe an infinite Series of *Moveds* without a *Mover*, or of *Effects* without a Cauſe.

For, it is not eaſy to conceive how *Thought*, or thinking *Subſtances*, can be propagated after the Manner of *Branches*, or in any Manner that can be analogous to it, or warrant a *metaphorical* Uſe of that Phraſe. It ſhould alſo be told, whether this *Traduction* be made from one, or from both the Parents. If from *one*, from which of them it is? And if from both, then the ſame *Tradux* or Branch muſt always proceed from *two* Stocks: which is a Thing, I preſume, that can no where elſe be found, or has any Parallel in Nature. And yet ſuch a Thing may much better be ſuppoſed of *Vines*, or *Plants*, than of *thinking Beings*, who are ſimple and uncompounded Subſtances.

This Opinion of *Traduction* of Souls ſeems to me to ſtand upon an *unſound* Foundation. For I take it to be grounded chiefly on theſe *two Things*: The Similitude there is between the *Features*, *Humours*, and *Abilities* of Children, and thoſe of their Parents; and the Difficulty Men find in forming the Notion of a *Spirit*. For from hence they are apt to conclude, *that there can be no other Subſtance but Matter: and that the Soul, reſulting from ſome Diſpoſition of the Body, or ſome Part of it, or being ſome merely material* Appendix *to it; muſt attend it, and come along with it from the Parent or Parents; and as there is a* Derivation *of the one, ſo there muſt be alſo of the other at the ſame Time*. Now the *former of theſe is not always true*, as it ought to be, to make the Argument *valid.* Nothing more common than to ſee *Children* differ from their *Parents,* in their *Underſtandings, Inclinations, Shapes, Complexions,* and, I am ſure, *from one another.* And this *Diſſimilitude* has as much Force to prove there is not a *Traduction,* as *Similitude* (whenever that happens) can have to prove there is.

Beſides, it ſeems to me not hard to account for ſome *Likeneſs* without the Help of *Traduction.* It is viſible the *Meat* and *Drink* Men take, the *Air* they breathe, the *Objects* they ſee, the *Sounds* they hear, the *Company* they keep, *&c.* will create *Changes* in them, ſometimes with Reſpect to their *Intellectuals,* ſometimes to their *Paſſions* and *Humours,* and ſometimes to their *Health,* and other Circumſtances of their Bodies; and yet the original *Stamina* and fundamental Parts of the Man remain ſtill the ſame.

The other Thing, which I take to be one of the principal Supports to this *Doctrine* of *Traduction,* (a Suppoſition that the *Soul is merely material, or but the Reſult of ſome Diſpoſition of Matter)* though we can have no *Image* of a *Spirit,* becauſe no being can be portrayed, or repreſented by an Image, but what is *material;* yet we may have Reaſon to aſſert, the *Exiſtence of ſuch a Subſtance. Matter* is a Thing which we converſe with, of which we know Part of its Nature and Properties; and ſince we cannot find among them any that are *cogitative,* or ſuch a Thing as *Life,* but ſeveral Things inconſiſtent with them, we are under a *Neceſſity* of confeſſing, *that there is ſome other* Species *of Subſtance beſides that which is* corporeal, and that *our Souls, of living Subſtance, are of that Kind.*

The *Soul* may contemplate the Body which it inhabits, may be *conſcious* of its own Acts, and reflect upon the *Ideas* it finds. They who found the *Traduction* of the Soul upon this Preſumption, that it is material, and attends the Body, as ſome Part or Affection of it, ſeem farther moſt wofully to miſtake upon this Account; becauſe the Body itſelf is not propagated by *Traduction.* It paſſes, indeed, through the Bodies of Parents, who afford a tranſitory Habitation and Subſiſtence to it: But it cannot be formed by the *Parents,* or grow out of any of them. For all the *vital* and eſſential Parts of it muſt be one *coeval* Syſtem, and formed at once, in the firſt Article of the naſcent *Animalculum;* ſince no one of theſe could be nouriſhed, or ever come to any Thing, without the Reſt: On the *contrary,* if any one of them could prevent and *be* before the Reſt, it would ſoon wither and decay again for lack of Nouriſhment received by proper Veſſels; as we ſee the Limbs and Organs of *Animals* do, when the Supply due from the animal *Oeconomy* is any Way intercepted or obſtructed. And ſince an organized Body which requires to be thus *ſimultaneouſly* made (faſhioned as it were at one Stroke) cannot be the Effect of any natural and gradual *Proceſs.* I cannot but conclude, that there were *Animalcula,* of every Tribe, originally formed by the *Almighty Parent,* to be the *Seed* of all future Generations of Animals. Any other Manner of Production would be like that, which is uſually called *equivocal,* or *ſpontaneous,* Generation, and with great Reaſon now generally exploded. And it is certain that the *Analogy* of Nature,

ture, in other Inſtances, and microſcopical Obſervations, do abet what I have ſaid, ſtrongly.

Laſtly, if there is no Race of Men that hath been from Eternity, there is no Man who is not deſcended from *two firſt Parents,* and then the *Souls* of theſe two firſt could be traduced from no other. And there is no ſuch Race (none that has been upon the Earth from Eternity) is apparent from the Face of earthly Things, and the Hiſtory of *Mankind, Arts,* and *Sciences.* We may conclude then, that the *human* Soul, with its Faculties of *Cogitation, &c.* depends upon a SUPREME BEING. And who can this be but the *Supreme Being,* or GOD.

See *Woolaſton*'s *Religion of Nature delineated.*

VIII. QUERE 139, *anſwered by Mr.* Thomas Huntley.

THE Free-agency of Man conſiſts in his having it in his Power to *act* or *not to act* according to the Determination of his *Will,* as ſaith the very ingenious and celebrated Author of the Eſſay on the *human Underſtanding.*

But to act muſt here be applied not only to external Objects, but to the internal Operation of our own Minds. — For *Inſtance,* if a Man has *Food* or *Fruit* ſet before him, with Liberty to act or to forbear as his Will inclines, he is in that Reſpect a free Agent.

But, if he be chained down, and a *Tree* loaded with ripe Fruit hanging over his Head, yet not within his Reach, the *Liberty* to eat agreeable to the Determination of his *Will* is deſtroyed. The ſame may be ſaid of a Man deeply in *Love,* who cannot obtain, nor yet withdraw his Affection from, the *darling Object* of his Love; his Freedom of Action is ſo far loſt.

IX. QUERE 140, *anſwered by Mr.* Thomas Huntley.

THE Idea of *Space* is acquired either by the Sight, or the Senſe of *Feeling*; and admits of a *threefold* Conſideration. *Firſt,* it ſignifies the Length or *Diſtance* between any two Points or Bodies. *Secondly,* it is applied to the whole Extent included between any two right or curved Lines, which may be called *ſuperficial* Capacity. And *thirdly,* it is applied to the whole Extenſion comprehended within two or more *Planes,* which, for Diſtinction Sake, may be called *ſolid Capacity.*

Anſwered by Mr. P. Antrobus, *at* Great Budworth, Cheſhire.

SPACE is Extenſion without *Matter,* or in plain *Engliſh,* a perfect Void or Vacuity, which is better conceived than defined. Sir *Iſaac Newton* conſiders Space as the *Senſorium* of the divine Mind.

The ſame anſwered by Mr. Williams, *of* Hackney.

TIME *is to Duration as Place is to* SPACE *or Expanſion.*

They are ſo much of thoſe boundleſs Oceans of *Eternity* and *Immenſity,* as is ſet out and diſtinguiſhed from the Reſt; and ſo are made Uſe of to denote the Poſition of finite real Beings in Reſpect of one to another, in thoſe infinite Oceans of Duration and Space. Each of theſe have a twofold Acceptation. *Firſt,* Time in general is taken for ſo much of finite *Duration* as is co-exiſtent with the Univerſe, and meaſured out by the Motion of its great Bodies. Thus it is uſed in the *Phraſes before all Time, and when Time ſhall be no more.*

Place is likewiſe taken for that Portion of infinite Space poſſeſſed by the material World; though this might more properly be called Extenſion. Within theſe *two* are confined the particular *Time*, or Duration, Extenſion, or Place, of all corporeal Beings.

Secondly, Time is ſometimes applied to Parts of that infinite Duration, that were not really meaſured out by real Exiſtence; but ſuch as we upon Occaſion do ſuppoſe equal to certain Lengths of meaſured Time as in the *Julian Period*, which makes an Excurſion of 764 Years beyond the Creation. Thus we may ſpeak of *Place* or *Diſtance* in the great *Inane*, wherein I can conceive a Space equal to, or capable of, receiving a Body of any aſſigned Dimenſions. See *Locke*'s *Human Underſtanding*.

The Extent of the *viſible* Univerſe, which we know on the *loweſt* Computation, muſt be nearly that of a Cube of 1,400,000,000,000 Miles Diameter, which contains near 3,000,000,000,000,000,000,000,000,000,000,000,000, *i. e.* 3 *Sextillions*, or three *Millions* of *Millions* of *Millions* of *Millions* of *Millions* of *Millions* of cubical Miles. — An amazing Space this! as to any Power of Imagination ſcarcely to be diſtinguiſhed from *infinite Space* itſelf! But ſince the vaſt viſible Syſtem of the Univerſe is that with which we are alone concerned, and ſuch as even wearies and amazes our *Faculties*, when we attempt ſo much as to imagine its Immenſity, I ſhall wade no farther into that *unfathomable* Abyſs of infinite extramundane Space; the nicer Conſideration of which, like that of infinite Duration or Eternity, is evidently too large for our finite Thoughts; and does ever more aſtoniſh and confound than profit and edify Mankind. And no Wonder, ſince it is highly probable that both of them, as to their inmoſt Nature, and largeſt Extent, are alone knowable by that HIGH and LOFTY ONE, who inhabits *Eternity*.

See *Whiſton*'s *Aſtron. P. Rel.*

Many have been the Objections to Sir *Iſaac Newton*, as if he repreſented *infinite Space* as an Attribute of the Deity. His Words are, "*He continues always, and is preſent every where; and by exiſting* "*always and every where, he conſtitutes* Duration *and* Space." But this is ſaying no more than that *Space and Duration do not neceſſarily exiſt*; becauſe GOD is eſſentially and neceſſarily preſent in them. This appears from the Words immediately preceding. *God is eternal and infinite; omnipotent and omniſcient*; i. e. he continues *from Eternity to Eternity*; and is preſent *from Infinity to Infinity*; *he governs all Things and knows all Things which are done, or can be known. He is not Eternity and Infinity, but eternal and infinite: He is not Duration and Space, but has Duration of Exiſtence, and is preſent.* Which laſt Words are ſo clearly expreſſive of his *Meaning*, that I am at a Loſs to conceive how they could be miſunderſtood. He accounts for the *neceſſary Exiſtence of Space* in a Way the moſt worthy of the *Deity*.

Mr. Rowe's *Anſwer.*

SPACE is defined by Mr. *Locke* to be a *ſimple Idea*, which we obtain both by our Sight and Touch — the *Modes* whereof are *Diſtance*, *Capacity*, *Extenſion*, *Duration*, &c.

X. QUERE 141, *anſwered by the* AUTHOR.

EYE *Nature's Walks, ſhoot Folly as it ſlies,*
And catch the Manners living as they riſe;

allegorically meaning Mr. *Pope*'s Quarry-hunting for *Vice*, *Folly*, and whatever *Manners* or *Cuſtoms* attend the Courſe of Man's Life; being the *Game* the Poet propoſed to *ſpring*, *ſhoot flying*, or *catch*, for his Prey. — Read *Gordon*'s *Geographical Grammar*, for an Explanation of the *Manners*, *Cuſtoms*, *Religion*, *&c.* of the People in different Nations; which *Manners*, *&c.* Mr. *Pope* propoſed to *diſcover*, or *catch*, (*living as they riſe*) as he found them.

XI. QUERE 142, *anſwered by Mr.* Alexander Rowe.

THE Twinkling of *Stars* (as in a former *Quere*) proceeds from the *Atoms* floating in the Expanſe, between them and the *Spectator*. And the Stars being viewed through a *Teleſcope*, *&c.* an infinite Number of the Rays of Light, and conſequently of the ſaid Atoms, will be excluded from the Eye, in Regard to what appeared before. — Hence, the Stars will in a great Degree appear *ſteady*, and the more or leſs ſo, according to a leſs or greater *Aperture* of the Tube.

XII. QUERE 143, *anſwered by* CLERICUS.

THE Original of this Title is ſaid to be *Father in Good*, according to the divine Office; but as GOD is the Sum of all *Goodneſs*, it is of late Years altered to *Father in God*.

XIII. QUERE 144, *anſwered by the* AUTHOR.

FLUXIONS, deduced from an indefinitely or infinitely ſmall Increaſe or Decreaſe of finite Quantities, are Nothing but the finite *Ratios* of the indefinitely or infinitely ſmall Quantities, by which the ſaid *finite Quantities* are increaſed or decreaſed, according to a given Condition.

Now, when any compound *variable Quantity* is gradually increaſed or decreaſed, on certain Conditions, till it becomes a *Maximum* or *Minimum*, (as may be the Caſe, when *conſtant* are compounded with *variable* Quantities, in an Expreſſion) its *Fluxion* or *Variation* will be Nothing in Reſpect of the *Fluxion* of its ſimple variable Quantity; it having then neither *Increaſe* or *Decreaſe*, in thoſe Circumſtances.

PROP. *But in all Caſes of Variation, if contemporary variable Quantities be equal to each other, or in a given* Ratio, *their* Fluxions *will be alſo equal, or in a given* Ratio; *and the contrary.*

Therefore, multiplying or dividing any *compound* variable Quantity (having a *Maximum* or *Minimum*, or not) by a given *conſtant* Quantity, *its Fluxion will have the ſame Ratio to the Fluxion of the ſimple variable Quantity multiplied or divided by the ſame conſtant Quantity.*

Thus, the Fluxions of xx and x, axx and ax, or $\frac{xx}{a}$ and $\frac{x}{a}$, are $2x\dot{x}$ to $\dot{x}$, $2ax\dot{x}$ to $a\dot{x}$, and $\frac{2x\dot{x}}{a}$ to $\frac{\dot{x}}{a}$, reſpectively, all in the ſame *Ratio*; being the *ſame* had xx been a *Maximum* or *Minimum*; as are likewiſe the *Fluxions* of $axx+b$, and $ax+b$, or $axx-b$, and $ax-b$, *reſpectively*. And the ſame *Fluxion*, of any Value, (and therefore of 0 Value when its Fluent is a *Maximum* or *Minimum)* may have an *infinite* Number of *Fluents*, as the *Fluent* of $\dot{x}$ *Fluxion* may be x, $a+x$, $b+x$, $x-a$, $x-b$, $x-c$, *&c.*

CONSEQUENTLY, *As the Product or Quotient of a* Maximum *or* Minimum, *in Quantity, on certain Conditions, is alſo a* Maximum *or* Minimum, *ſo likewiſe a given* Addition *or* Subtraction, *in Quantity, to and from that given Product or Quotient (being a* Maximum *or* Minimum, *on certain Conditions) will be a* Maximum *or* Minimum *alſo*; *making no Alteration in the Property of given Conditions.*

The PRIZE-QUERE *for* 1762, *anſwered by Mr.* Williams, *of* Hackney.

ACCORDING to *Bedford*'s Chronology, *Solomon* kept the great *Feaſt* for Dedication of the *Temple*, in the 3705 of *Jul. Period*, or 1009 current before *Chriſt*.

This Feaſt laſted 8 Days, and the 1ſt and laſt Days were the moſt *remarkable*, in the Month *Ethanim*, or 7th Month; and on the 23d of that *Month* he ſent the People away; 1 *Kings* viii. 2 *Chron.* vii. 10.

The *Jews* reckoned their Year ſo to begin, on the *firſt* Month *Niſan*, that the 14th of *Niſan*, at Eve, or 15th Beginning, was on the Day of the *Full Moon*, (the Paſſover being kept on the 14th in the *Eve)* which immediately followed the Sun being in the *autumnal* or *vernal* Equinox, before and ſince *Moſes*; by which their 1ſt Day of *Niſan* in the Year happened on the Day of that *New* Moon, (which could not be well diſtinguiſhed till the Time of *Full Moon* was obſerved;) the *firſt* Month *Niſan* was therefore in *Autumn* before, but in the *Spring* ſince *Moſes*.

Bef. Chr. Vern. Equinox, Eq. Time. Full ☽.
1009 . . . *Mar.* $30^{d}\,7^{h}\,43^{m}\,24^{s}$ . . . *Apr.* 22^{d} . . 15th *Niſan*.
Rem. Days. N°. Month.
—— *Apr.* 8 . . . 15th *Niſan* . . 1
May 31 . . . 29 . . . 2
June 30 . . . 30 . . . 3
July 31 . . . 29 . . . 4
Aug. 29 . . . 30 . . . 5
Sep. 30 . . . 29 . . . 6

To which *Oct.* 17 and 24 O. S. anſwers *Oct.* 7 and 17 N. S. The N. S. 10 Days back of O. S. by *practical Rule*, P. 176, *Royal Aſtronomer.*

161 . . 162
Oct. 24 . . . 23 laſt Feaſt-Day, 7 or *Ethanim.*
— 7 — 7

Oct. 17 . . . 16 firſt Feaſt-Day.

Now, by *Pall.* 1762, *P.* 4, and *Royal Aſtronomer and Navigator*, P. 148, the Dom. Letters for 1009 bef. Chr. (being *Biſſextile* were DC, Old Style. And by *Tab. P.* 3. *Pall.* 1762, the Dom. Letters for 1009 bef. *Chriſt* were AG, *New Style.* — Whence, by P. 3. *Pall.* 1762, *Oct.* 17th and 24th, O. S. and *Oct.* 7th and 17th, N. S. were all on a *Sunday*; being the firſt and laſt Days of the ſaid *Feſtival.*
W. W. R.

The ſame anſwered by Mr. John Lyon, *of* Margate, *in* Kent.

BY *Royal Aſtronomer and Navigator*, P. 146, *Solomon* laid the Foundation of the Temple in 1017 Yr. current before Chriſt, which was on the 2d Day of the 2d Month *Zif*, (ſee *Chron.* ii. *Chap.* 3.) and finiſhed it in the 8th Month *Bull*, (ſee *Kings* i. *Chap.* 6.) it being 7,5 Years in building. Now, as the People went every one to their *Tents* on the 23d Day of the 7th Month, (ſee *Chron.* ii. *Chap.* 7.) conſequently, it muſt be on the following Year. Whence 7,5+1=8,5 and 1017—8,5=1009 current before Chriſt.

The *antient Jews* reckoned their Years by the Moon's Motion, *ſee P.* 179 *of the before-cited Author*; the *Jewiſh* Paſſover being kept on the 14th of the 1ſt Month, at Eve, or 15th Beginning, at Full.

	Sin. *Chr.*		Mean N. ☽.	*Jan.*		
By *P.* 385, *R. Aſtron.*	1792,		12^d	10^h	12^m	34^s
Motion for Yrs.	2800	—	3	10	8	13
Year before *Chr.*	1009,		9	0	4	21
Mar. Biſ. 1 Day leſs,		+	28	14	12	9
O.S. New ☽,	*April*		6	14	16	30
½ Revolution		+	14	18	22	2
M. Full Moon, *Apr.* 1009,	O. S.		21	8	38	32

Or New 7th *Apr.* Morn. and Full 22d Morn. according to *vulgar Reckoning*; being the 1ſt Full Moon after the vernal *Æquinox* on the 30th of *March*, 8^h nearly by the *Royal Aſtronomer*.

Bef. *Chr.*						
1009 . ,	*April* 7	. .	1ſt	*Niſan*,	N. Moon.	
	22	. .	15	*Niſan*,	F. Moon.	
Rem.	*April* 8	. .	15	*Niſan* .	1	Month.
	May 31	. .	29	. .	2	
	June 30	. .	30	. .	3	
	July 31	. .	29	. .	4	
	Aug. 31	. .	30	. .	5	
	Sep. 30	. .	29	. .	6	
	161	.	162			
	Oct. 24	. .	23	Laſt Day 7		
	— 17	. .	16	Firſt Feaſt Day.		

To which *October* 17 and 24, O. S. anſwers *October* 7 and 14, N. S. (See univerſal practical Rule, P. 176, *R. Aſtronomer.*)

Now, by *Tab.* P. 148, *Royal Aſtronomer*, the Dominical Letters for 1009 before *Chriſt*, O. S. were DC. And P. 149, Dom. Letters for 1009 before *Chriſt*, N. S. were AG, by which, Page 149, *October* 17 and 24, O. S. and *October* 7 and 17, N. S. the firſt and laſt Days of the Feſtival were on *Sundays*, required.

ANSWERS

ANSWERS to the REBUSES in the PALLADIUM, 1762.

I. BROWN. II. OAKHAM. III. LONDON.

The 1ſt, 2d, and 3d Rebuſes anſwered as follows by Mr. John Clark, *of* Lincoln.

I.

WITH *Art* you ſtrive to hide your *Rebus*,
And draw your Shade extremely dark,
Yet I, without the Help of *Phœbus*,
Pronounce it BROWN; from your's *John Clark.*

II.

FRIEND *Knowles*, I'd have you to take Care,
And mind what you ſay of the *Fair*,
Or they will think you joke 'em;
'Tis clear you do at *Epſom* dwell,
And yet to ev'ry one you tell
Your dear Nymph lives at "OAKHAM."

III.

ROGER to *Kitty* talks of Love,
And that to her he'll conſtant prove,
Yet fears ſhe may be undone;
But howſoever that may be,
Friend *Swift*, 'tis Nought to you or me,
Though we were both in "LONDON."

Mr. *Pennington* anſwered the 2d *Rebus* in Verſe.

Mr. P. Antrobus *anſwers the 1ſt and 2d* REBUS *thus*.

FRIEND *Dallinger*'s Laſs is Miſs BROWN, I declare,
And OAKHAM's the Town where lives *Knowles*'s Fair.

Mr. *W. Swift*, of *Stow*, anſwered the 1ſt and 2d *Rebus*.

Mr. *Iſaac Tarrat*, of *Epſom*, anſwered all the *Rebuſes*. Mr. *Ford*, of *Stow* School, anſwered the 1ſt and 2d. Mr. *James Brown Aſhton*, of *Stow* School, anſwered the 3d *Rebus*. Both which young Gentlemen propoſed *new Ænigmas* we have not Room for.

Mr. *John Buddle* anſwered the 1ſt, 2d, and 3d *Rebus*, in Verſe. Mr. *William Wells*, of *Howden, Yorkſhire*, anſwered the *Rebuſes* and *ſeveral* of the *Ænigmas*. Mr. *Thomas Sadler* anſwered all.

ANSWERS *to the* PARADOXES *for* 1762.

I. DAUGHTER. II. PALLADIUM.

I. PARADOX *anſwered by Mr.* John Clark, *of* Lincoln, *in the Character of* Teague.

BY my Shoul, my dear *Honey*,
Without any Laughter,
You walk'd, by yourſelf,
Along with your DAUGHTER.

II.

II. PARADOX *anſwered by the Same.*

YOUR *Paradox*, dear *Miſs*, I make no Doubt,
By the PALLADIUM's Help, I've found it out.

Mr. *Pennington*, of the *Cheſhire* Militia, Mr. *William Swift* of *Stow*, Mr. *Iſaac Tarrat* of *Epſom*, Mr. *John Buddle* of *Cheſter-le-Street*, Mr. *Marſhall* of *Blenchland*, Mr. *Thomas Sadler*, and Mr. *Alexander Rowe*, anſwered the *Paradoxes*; as did ſeveral Others.

Mr. Rowe *ſays*,

Prop the Palladium, *aid it with your Tears,*
And try to make it live theſe hundred Years.

ANSWERS *to the* QUESTIONS *in the* PALLADIUM, 1762.

I. QUESTION 203, *anſwered by Mr.* John Pennington, *Officer in the Royal* Cheſhire *Militia.*

LET a, e, y, repreſent the three Maidens Ages.

Then *per* Queſt. $\left|\begin{array}{c|l} 1 & ae+ay=504 \\ 2 & ae+ey=544 \\ 3 & ay+ey=600 \end{array}\right.$

$$2ae+2ay+2ey=1648=\text{Sum}$$
$$ae+ay+ey=824=\tfrac{1}{2}\text{ Sum.}$$

Subtract 3, 2, and 1 Equations from their Half Sum, and

$ae=224$
$ay=280$

$ey=320$. Whence $\frac{320}{e}=\frac{280}{a}$ ∴ $320a=280e$, and

$\frac{320a}{280}=\frac{224}{a}$. Hence $aa=\frac{62720}{320}=196$; $a=\sqrt{196}=14$; $e=16$, $y=20$, the Ages required.

Mr. *P. Antrobus*, of *Great Budworth*, in *Cheſhire*, puts a, e, and x, $=$ the Ages of the three Maidens, and $b=600$, $c=544$, and $d=504$; whence $e+xa=b$; $a+xe=c$; $a+ex=d$, then bringing out the Equations, he finds $a=14$, $e=16$, $x=20$, the Ages of the *three Maidens*, young enough for Lovers.

Mr. *William Kernot*, of *Wincheſter*, anſwers it in a ſimilar Manner to the above; as did Mr *Tho. Vanner*, of *Sandbury*, in *Middleſex*; Mr. *N. Spooner*, of *Newmarket*; Mr. *William Wells*, of *Howden*, *Yorkſhire*; Mr. *Lyon*, at *Margate*, *Kent*; Mr. *William Chapman*, of *Foxton*, *Leiceſterſhire*; Mr. *John Buddle*; *Cheſterfieldienſis*; Mr. *Alexander Rowe*, of *Reginnis*, *Cornwall*; Mr. *Matthew Ward*, of *Wortley*, *Yorkſhire*; Mr. *Thomas Sadler*, near *Wrenbury*, *Cheſhire*; Mr. *Thomas Sanderſon*, of *Harborough*; and ſeveral others.

Mr. *Thomas Walker*, of *Stanton Bury*, near *Newport Pagnel*, *Bucks*, puts $b=600$, $c=504$, $d=544$, $s=b+c+d$, a, e, and u, for the 3 Ages, analytically determines $a^2 = \frac{s^2 - 2ds - 2bs + 4bd}{2s - 4c}$,

and $a = \sqrt{196} = 14$, $e = \frac{s - 2b}{2a} = 16$; $u = \frac{s - 2d}{2a} = 20$,

Mr Edward Johnſon, *of* Hull, *anſwers it thus.*

PUT $a = 504$, $b = 544$, $c = 600$, and x, y, and z, their reſpective Ages; alſo let $xy = s$, $xz = m$, $yz = n$, then, *per Queſt.* $s + m = a$; $s + n = b$; and $m + n = c$. From which Equations we get $n = \frac{b + c - a}{2} = 320$; $m = \frac{c + a - b}{2} = 280$, and $s = \frac{a + b - c}{2} = 224$.

Whence, $z = \sqrt{\frac{\overline{b + c - a} \times \overline{c + a - b}}{2 \times \overline{a + b - c}}} = 20$, $y = \frac{n}{z} = 16$, and $x = \frac{m}{z} = 14$. W. W. R.

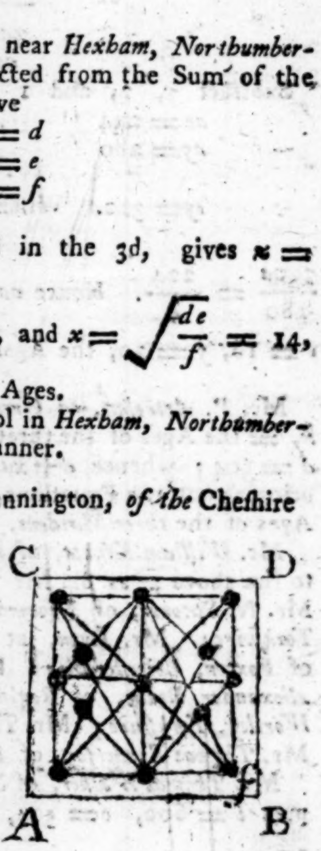
Mr. *Thomas Marſhall,* of *Blenchland,* near *Hexham, Northumberland,* obſerves that each Equation ſubtracted from the Sum of the other two, (ſubſtituting as above) will give

$$1.\ xy = a + b - c = d$$
$$2.\ xz = a + c - b = e$$
$$3.\ zy = b + c - a = f$$

Whence y, in the 1ſt, $= \frac{d}{x}$ ſubtracted in the 3d, gives $x = \frac{fx}{d}$; *per* 2d $z = \frac{e}{x}$; whence $\frac{fx}{d} = \frac{e}{x}$, and $x = \sqrt{\frac{de}{f}} = 14$, hence $y = 16$, and $z = 20$, the required Ages.

Mr. *John Smith,* of Mr. *Wilkins*'s School in *Hexham, Northumberland,* ſolved it in the *very ſame* elegant Manner.

II. QUESTION 204, *anſwered by Mr.* Pennington, *of the* Cheſhire *Militia.*



PUT $a =$ the Breadth of the Canal, and $e = 310 = ef$; then $2a + e =$ AB. And let $\frac{3ee}{4} = n$; then, by a well-known Theorem, and *per Queſt.* $aa + ea = \frac{n}{12}$ ∴ $aa + ea + \frac{ee}{4} = \frac{n}{12} + \frac{ee}{4}$.

And $a = \sqrt{\frac{n}{12} + \frac{ee}{4}} - \frac{e}{2} = 18.885$. —— Mr. *Lyon*, of *Margate, Kent*, anſwered the ſame; as did Mr. *John Buddle*; Mr. THOMAS MARSHALL, of *Blenchland*, making the Canal's Breadth = 18.884528 Feet; Mr. *Alexander Rowe* the ſame; *Cheſterfieldienſis*; Mr. *Matthew Ward*; Mr. *Thomas Sadler*; and Mr. *Thomas Sanderſon*.

The Trees may be planted as in the *Figure*.

Mr. *P. Antrobus* anſwers it thus. — As the Surface is to be raiſed 3 Feet, the Surface multiplied by 3 gives 307200 ſolid Feet of Earth, which muſt be = the Trench multiplied by 12. So that if the 4 Squares at the Corners are reckoned, as I take it they ſhould, then putting $a =$ the ſolid Feet, $b = 320$, and $x =$ Breadth of the Trench, $a = 4xx + 4bx \times 12$; and $\frac{a}{48} = xx + bx$; whence by comp. □, and extr. Root $x = \sqrt{\frac{a}{48} + 25600} - 160 = 18.88$ Feet, the *Canal*'s Breadth.

Mr. *Thomas Walker* finds the Canal's Breadth, by a ſimilar Method = 18.8 Feet. Mr. *N. Spooner*, of *Newmarket*, finds it 18.8854.

Mr. *William Chapman*, of *Foxton, Leiceſterſhire*, finds the Ditch's Breadth, by a Method, like the above = 18.885, *&c.* confirming the Truth of the foregoing *Solutions*.

III. QUESTION 205, *anſwered by Mr.* Pennington, *of the* Cheſhire *Militia.*

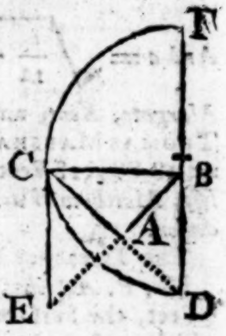
ANY *Parallelogram*, whoſe Ends are *Unity*, being encreaſed by *Unity*, will become double in *Area*, to what it was before. Therefore, if 500 Sheep are folded with an 100 Hurdles, 102 Hurdles is the leaſt Number that will fold 1000 Sheep. W. W. R.

Mr. P. *Antrobus*, Maſter of the Grammar School at *Budworth*, in *Cheſhire*, anſwers it in the ſame elegant Manner, making 49 Hurdles, to each Side of a Parallelogram, and 1 at each End, fold 500 Sheep; adding 2 more Hurdles at each End, (widening the *Parallelogram*) to fold 1000 Sheep.

The ſame was anſwered by Mr. *John Smith*, of Mr. *Wilkins*'s School, at *Hexham, Northumberland*; Mr. *W. Wells*, of *Howden, Yorkſhire*; Mr. *John Buddle*, of *Cheſter-le-ſtreet*; Mr. THOMAS MARSHALL, of *Blenchland*; Mr. *Matthew Ward*; *Cheſterfieldienſis*; and *ſome others*; but *moſt of our Correſpondents* ſolved this Queſtion by Proportion, in which they widely miſtook.

IV. QUESTION 206, *anſwered by the* Author *of the* Royal Aſtronomer and Navigator.

THIS is one of thoſe *Queſtions* worthy the Subject, and Practice of Solution; being uſeful in *Geometry* as well as in *Surveying*. — And we wiſh that all our Correſpondents would ſtudy to ſend us Things of *real Uſe*, or of Elegance in Example.



Conſtruction. Set off 8 Chains 48 Links from B to D along one of the Foot-Paths; then ſet off 12 Chains 48 Links from B to F, in DB continued. Find a mean Proportional BC, between DB and BF, which ſet off, from B to C, at right Angles with DB, then erect a Perpendicular CE = BF = 12 Chains 48 Links; and draw Lines from E to B, and D to C, and the △ ABC, right-angled at A, will be the △ required to be meaſured, whoſe Sides were *overflown*, with the three Trees ſtanding at A, B, and C.

To find the Dimenſions of which △. The Square Root of the Product of the two Diſtances, meaſured on the *Foot-Paths* ($\sqrt{12{,}48 \times 8{,}48}$) = 10,28739 *Chains* = the *longeſt* Side of the △ = CB. For △s DBA, ABC, DBC, BCA, ACE, and BCE, are all *ſimilar*. Whence, DB : BC :: BC : CE, And $\sqrt{BD \times CE} = CB$.

By 47. *e.* 1. CD = 13·33319 Chains. — Now, As CD : CB :: AC = 7·9381; and CD : BD :: BD : AD = 5·3938. Whence $\sqrt{CA \times AD} = 6{\cdot}5434$; but, as CD : BD :: CB : AB = 6.5434, as before.

$$\text{Now, } \frac{CA \times CB}{2} = 25{\cdot}97108 \text{ Chains} = \overset{\text{A.}}{2}\quad \overset{\text{R.}}{2}\quad \overset{\text{P.}}{15{\cdot}537}, \text{ \&c.}$$

The ſame anſwered by Mr. Edward Johnſton, *Mathematical Maſter of* Hull, *in a Workman like Manner.*

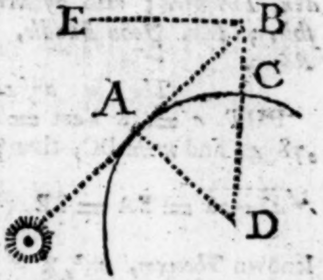
PUT $BD = 8{,}48 = a$, $CE = 12{,}48 = b$, $BC = x$, and $AC = y$. By ſimilar △s, $a : x :: x : b$, ∵ $x = \sqrt{ab} = 10{,}287$; alſo $b : y :: x : \frac{xy}{b} = AB$. But $AC^2 + AB^2 = BC^2$ (*e.* 47. 1.) that is, $\frac{x^2y^2}{b^2} + y^2 = x^2$, which, by writing $\sqrt{ab}$ for x, becomes $\frac{ay^2}{b} + y^2 = ab$, ∵ $y = b\sqrt{\frac{a}{a+b}} = 7{,}938 = AC$; whence $AB = \frac{xy}{b} = b\sqrt{\frac{b}{a+b}} = 6{,}543$, and the Area =

A. R. P.
2 2 15½. W. W. R.

Mr. *Lyon*, of *Margate, Kent*, anſwered the ſame as above; as did Mr. *William Chapman*, of *Foxton*, *Leiceſterſhire*; Mr. *John Buddle*, of *Cheſter-le-Street*; Mr. *Alexander Rowe*, of *Reginnis*, *Cornwall*; *Cheſterfieldienſis*; Mr. *Thomas Sanderſon*; Mr. *Marſhall*, of *Blenchland*; and *ſome others*.

V.

V. QUESTION 207, *anſwered by Mr.* THOMAS MARSHALL, *of* Blenchland, *near* Newcaſtle.



THE Depreſſion $8^h\,26^m\,56^s$ (being the Time the Sun riſes on the 21ſt of *December,* in Latitude 54°) in Latitude 64° is found to be 6° 55′ = ∠EBA = BDA, which, by the Nature of *Secants,* (ſuppoſing the Earth's *Radius* 6980000 Yards) ,0073 3·1 × 6980000 = 51170,38 Yards, the Mountain's Height; which will be ſomething different when *Refraction* is conſidered.

Mr. *John Buddle,* of *Cheſter-le-Street,* anſwers it much in the ſame Manner, with the ſame Concluſions.

The ſame anſwered by Cheſterfieldienſis.

PUT AD = 3984,58 Miles, the Earth's Semidiameter, according to *Norwood*; and let ⊙B repreſent the Horizon of the Place whoſe Latitude is 54°, touching the Earth at A, and extending itſelf to B, the *Mountain*'s Top, in the Place where the given Latitude = 64°. Conſequently, the Mountain's Height will be BC *ſought*. — Then, in the rectangled plane △ ADB, will be given AD = 3984,58 = *r* M DC; and the right ∠ DAB, by the *Tang.* ⊙B, and the Earth's Diameter DA, = S. 90°, whoſe *Tab. Sine* = 1; alſo ∠ ADB = 10° = Dif. given Latitudes, whoſe Comp. = 80° = ∠ ADE, whoſe Sine = ,9848077 = *m*, *To find the Mountain's Height* BD?

— Say $m : r :: 1 : \frac{r}{m}$ = DB = 4046,048 Miles, — 3984,58 = 61,468, the Mountain's Height required; [*higher than any Mountain in the World.*]

N. B. *When the Sun is* $1^h\,45^m$ *high at the firſt Place, whoſe Latitude is* 54°, *it will then be ſeen to riſe at the ſecond Place, whoſe Latitude is* 64°, *juſt at the Bottom of the* (imagined) *Mountain, omitting Refraction, as not mentioned in the Queſtion.*

☞ *See this Queſt. anſwered farther on by Mr.* Johnſon *of* Hull. — *There being ſuch Difference, we leave the Reader to examine and decide Truth; being willing to give Merit its due, to whomſoever it belongs.*

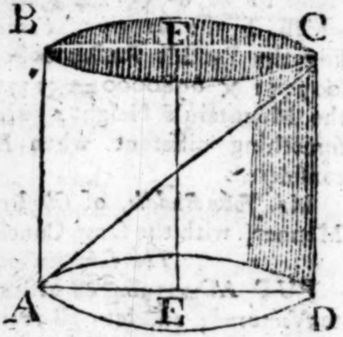
VI. QUESTION 208, *anſwered by Mr.* Edward Johnſon, *of* Hull.

LET d = diagonal Line = 8 Feet, x = Length in Feet? Then $\sqrt{d^2 - x^2}$ = Baſe Diameter; and *per Queſt.* $x \times \overline{d^2 - x^2}$ muſt be a *Maximum.* In Fluxions $d^2\dot{x} - 3x^2\dot{x} = 0$, hence $x = \frac{d}{\sqrt{3}} = 4{,}6188$, the Length; and $\sqrt{d^2 - x^2} = d\sqrt{\frac{2}{3}} = 6{,}5319$, the Baſe Diameter. Now put $a = {,}7854$, and the ſolid Content is $= \frac{2ad^3}{3\sqrt{3}} = 154{,}7743$ Feet, which, at 2*s.* *per* Foot, comes to 15*l.* 9*s.* 6*d.* ½, *ferè*. W. W. R.

Cheſterfieldienſis ſolved it in the ſame ſhort and correct Manner; it was alſo ſhortly and correctly anſwered by Mr. *William Wells*, of *Howden*, *Yorkſhire*; alſo by Mr. *William Chapman*, of *Foxton*, *Leiceſterſhire*; Mr. *John Buddle*, of *Cheſter-le-Street*; and Mr. *Alexander Rowe.*

The ſame anſwered by Mr. Thomas Walker.

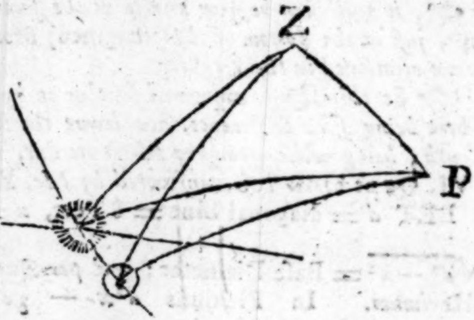
PUT $a = 8$ Feet $=$ AC, $p = ,7854$, and $x =$ BC, then *per* 47. *e.* 1. $\sqrt{a^2 - xx} =$ BA $=$ FE. And, *per* a known *Theorem*, $px^2 \times \sqrt{a^2 - x^2} =$ Solidity of the *Cylinder* which muſt be a *Maximum*. Therefore $x^2 \times \sqrt{a^2 - x^2}$, or $a^2x^4 - x^6 =$ a *Maximum*. Fluxed, $4a^2x^3\dot{x} - 6x^5\dot{x} = 0$. Reduced, $x^2 = \frac{2}{3}aa$, and $x = \sqrt{\frac{2}{3}a^2} = 6,532$; therefore FE $= 4,6188$, Solidity $= 154,7778$ *Feet*; which, at 2*s.* *per* Foot, comes to 15 *l.* 9 *s.* 6 *d.* $\frac{1}{2}$,



Mr. Marſhall *of* Blenchland's *Anſwer.*

PUT $x =$ the Height of the Cylinder, then $\sqrt{64 - xx} =$ Diameter of its Baſe, hence $64x - x^3$ is a *Maximum*. By Fluxions, &c. $x = \sqrt{21\frac{1}{3}} = 4,6188$, whence the Diameter of the Baſe is $\sqrt{42\frac{2}{3}} = 6,532$, *fere*; and the Solidity 154,77784 Feet, and the Value 15 *l.* 9 *s.* 6 *d.* $\frac{1}{2}$,681.

VII. QUESTION 239, *anſwered by Mr.* J. Buddle, *of* Cheſter-le-ſtreet.

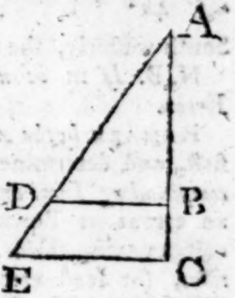


PUT x and $y =$ Sine and Coſine of the Latitude c and $-d$, thoſe of the Diſtance from the Pole P $= 113°\frac{1}{2}$; $-q =$ Coſ. of Z⊙ $= 108°$. Then by Spherics $1 : \frac{x}{y} :: \frac{dx}{cy} =$ Sine of the aſcenſional Difference $=$ Coſine of ∠ *PZ; and $\frac{dx-q}{cy} =$ Coſ. ∠ ⊙PZ, which is double the ∠ *PZ; therefore (by *Emerſon*'s *Trigonometry*, P. 10.) $\frac{2d^2x^2}{c^2y^2} - 1 = \frac{dx-q}{cy}$; ſubſtitute $\sqrt{1 - xx}$ for y, and the Equation becomes $2d^2x^2$

$\frac{2d^2x^2}{c^2-c^2x^2}-1=\frac{dx-q}{c\sqrt{1-xx}}$; from whence x may be determined, *if any Body cares to take the Trouble.*

Mr. *Marſhall*, of *Blencbland*, ſent us his *analytical Solution, whoſe* final *Equation was of the 4th Power, adfected. — Who informs us of another Solution he has correctly performed, after a different Manner.*

VIII. QUESTION 210, *anſwered by Mr.* Edward Johnſon, *of* Hull.



SINCE AD is given = 400 Miles, and AB = EC; let AB be ſuppoſed = 322, then $BD=\sqrt{AD^2-AB^2}=237$, and $AC=\frac{AB^2}{BD}=437$.

But Lat. ſailed from 47° 0′ N. . . . 3203 Mer. Parts.
Dif. Lat. AB, 322 Miles 5 22 S.

41 38 N. . . . 2752 Mer. Parts.

Merid. Dif. Lat. 451 Miles.
From which take AC 437 Miles.

Error 14 too much.

Again, ſuppoſe AB = 324, and work as before, and you will find the Error 6 Miles too much; then ſay, as 8 (Diff. of Errors) : 2 (Diff. of Suppoſitions) :: 6 (leſs Error) : 1,5. Therefore AB = 324 + 1,5 = 325,5 duly corrected.

Whence, BD = 232,4, and AC = 455,8; and thence $\frac{BD}{AD}$ = ,581, the natural Sine of 35° 31′, the *Courſe* from the South. W. W. R.

Mr. *Marſhall*, of *Blencbland, a very capable Correſpondent*, obſerves, that the beſt Way to anſwer this Queſtion will be, *at once*, by the Method of Tryal and Error. See *the Royal Aſtronomer and Navigator, for* ANSWERING *all Queſtions of this Nature.*

Mr. Alexander Rowe's *Anſwer.*

PUT $a=400$, Radius = 1, and x = nat. S. Courſe; then $\sqrt{1-x^2}$ = Coſ. Courſe. *Per Principles* of Navigation, As $1:a::\sqrt{1-x^2}:a\sqrt{1-x^2}$ = S. Diff. of Latitude. — Now, aſſume the *meridional* Diff. Lat. $=321=m$; then, As $\sqrt{1-x^2}:m::$

$x : \frac{mx}{\sqrt{1-x}} =$ Diff. Long. Therefore *per Queſt.* $\frac{xm}{\sqrt{1-x^2}} = a\sqrt{1-x^2}$ and $mx = a - ax^2$, or $x^2 + \frac{m}{a}x = 1$. Solved $x = \sqrt{\frac{m^2}{4a^2}+1} - \frac{m}{2a} = ,67625$, anſwering to 42° 33′ from the South weſterly, the *Courſe* ſteered, as required. W. W. R.

N. B. *If* m *be not aſſumed true it may be found true by Trial and Error.*

REMARK *by the Author.* It will be beſt to aſſume the Courſe at firſt, and determine it altogether by *Trial* and *Error*; otherwiſe the *compounding Trial and Error,* in the above Solution, with the Uſe of an erroneous Equation, will be like Mr. *Brown*, of *Portſmouth*, compounding *Trial and Error* in the Solution of his *erroneous Equations,* (at leaſt erroneous Solution) P. 45. *Pall.* 1761, where he differs from Mr. *Jones*'s Numbers, from whence the *Queſtion* was propoſed; multiplying *Difficulty* and *Error*, (and objecting to the Truth of eſtabliſhed Principles in Navigation) inſtead of uſing Trial and Error at firſt, for the whole Solution, as moſt eaſy and correct.

IX. QUESTION 211, *anſwered by Mr.* Pennington, *of the* Cheſhire Militia.

BY the Method of *Trial* and *Error*, I find $a = 10$, and $z = 2$, anſwering the Conditions of the Queſtion. W. W. R.

Mr. *Thomas Walker*, by *Trial* and *Error*, finds it thus.

Mr. Edward Johnſon, *of* Hull, *anſwers it thus.*

FIRST, we have $az = 20 =$ twice the Area, *ſecondly*, $a^z = 100$, or Log. $a \times z =$ Log. 100, *per* Queſt. From 1ſt Equation, $z = \frac{20}{a}$, which ſubſtituted for z, above, we have Log. $a \times \frac{20}{a} =$ Log. $100 = 2$. ∵ Log. $a \times 20 = 2a$, whence $a = 10$, and $z = 2$, *conſequently*, the Hypothenuſe $= 10{,}198$. W. W. R.

The ſame Qneſtion was anſwered by Mr. *William Wells*, of *Howden*, in *Yorkſhire*; Mr. *William Chapman*, of *Foxton*, *Leiceſterſhire*; Mr. *Buddle*, of *Cheſter-le-ſtreet*; Mr. THOMAS MARSHALL, of *Blenchland*; *Cheſterfieldienſis*; Mr. *Alexander Rowe*, of *Reginnis*, *Cornwall*; Mr. *Thomas Sanderſon*, of *Harborough*; and Others.

X. QUESTION 212, *anſwered by Mr.* Alexander Rowe, *the Propoſer.*

BY *Theorems* well known, the tranſverſe and conjugate *Axes* of the Spheroid are found $= 94.5$ and 53.2, reſpectively. — Now, *for the greateſt inſcribed Cone*; put $a = 94.5$, $b = 53.2$, and $x =$ the Cone's Altitude. Then $a - x =$ the Part of the tranſverſe Diameter. And *per* Property of Ellipſis, as $a^2 : b^2 :: x \times \overline{a-x} :$

ab^2x

$\frac{ab^2x - b^2x^2}{a^2} = \square$ Cone's Semidiameter; $\because 4 \times \frac{ab^2x - b^2x^2}{a^2} \times p \times \frac{x}{3} =$ Cone's Solidity (where $p = ,7854$) a *Maximum*; or $ax^2 - x^3 = a$ *Maximum.* In *Fluxions* and reduced, gives $x = \frac{2}{3} a = 63$; conſequently the *Solidity* $= 41493{\cdot}58$, *&c.* W. W. R.

The ſame analytically anſwered by Mr. John Buddle, *of* Cheſter-le-ſtreet.

PUT $2x =$ Tranſverſe, $2y =$ Conjugate Diameter. Then $\overline{2x + 4yy} \times ,5236 = 140040,84128 = b$; alſo $2 \times 3,1486 \times y \times \frac{x^3}{\sqrt{x^2 - y^2}} Q + y = 13741,1974 = c$, by Queſt. where $Q = ,017453 \times$ Degrees in the Arch, whoſe Sine is $\frac{\sqrt{xx - yy}}{x}$, (ſee *Emerſon*'s Fluxions, 2d Edit. Pages 276, 277) put $p = ,5236$, then from the former Equation $y = \sqrt{\frac{b}{8px}}$, which ſubſtituted in the latter gives $12p \times \sqrt{\frac{b}{8px}} \times : \frac{x^3}{\sqrt{x^2 - \frac{b}{8bx}}} \times ,017453 \times$ Degrees, whoſe Sine is $\frac{\sqrt{xx - \frac{b}{8px}}}{x} : + \sqrt{\frac{b}{8px}} = c$; from whence x may be determined by *Trial and Error.*

XI. QUESTION 213, *anſwered by the Propoſer, Mr.* Paul Sharp, *of* Biddenden, *in* Kent.

PUT $3,1416 = c$, $0,630547 = a$, and the Abſciſſa $= 3x$, then the Semiordinate $= 2x$, and Parameter $= \frac{4x}{3}$ *Per Conics*, $\because \frac{8cx - 4ax}{3} =$ the Curve of the ſaid Parabola, (*per* Queſt. 17th, *Palladium* 1760) and by the Doctrine of Fluxions the Area of the ſaid *Parallelogram* $= \frac{8x^2}{\sqrt{3}} = \frac{8cx \mp 4ax}{3}$ *per Queſt.* Whence $3x =$

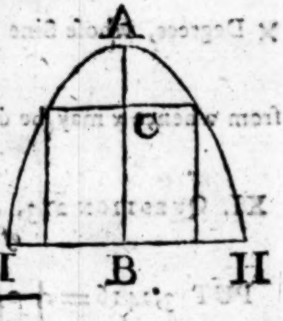
$c \mp$

$\overline{c - \frac{a}{2}} \times \sqrt{3} = 4{,}89534 =$ the *Abſciſſa*, and $4x = 6{,}52712 =$ the bounding Ordinate. Whence the Area of the *Parabola* is $= 21{,}301647$, and the Curve $= 12{,}29847 =$ the *Area* of the greateſt inſcribed ▭. W. W. R.

Mr. *Alexander Rowe* attempts a Solution by an Abſciſſa $= 3 = a$, and Ordinate $= 4 = b$, whoſe Curve $= 5.1986 = c$; putting $x =$ required Abſciſſa. *Per ſimilar Figures,* (he ſays) as $a : b :: x : \frac{bx}{a} =$ required Ordinate; and as $a : c :: x : \frac{cx}{a} =$ required Curve.

Moreover $\frac{x}{2} =$ Breadth of the greateſt inſcribed ▭ *(erroneouſly)* and *per* Parab. Property, as $x : \frac{b^2x^2}{a^2} :: \frac{x}{2} : \frac{b^2x^2}{2a^2} =$ □ of correſponding Semiordinate, or ▭'s Length; ∴ (he ſays) $\frac{bx}{1.41421\,a} \times \frac{x}{2} = \frac{cx}{a}$, *per* Queſtion. Whence $x = 3{,}67596$; ▭'s Area $=$ 6.369948, (Length $= 3{,}46573$, Breadth 1.837998) *inſtead* of 21.3, *&c.* omitting to take the Maximum into Conſideration.—*Thus we obſerve the wrong Road, by a capable Correſpondent, only to prevent others going aſtray.*

True Anſwer by Mr. John Buddle.



PUT $3x =$ AB, $4x =$ HG, $2x =$ HB, $x =$ AC, $2x =$ CB. Then $3x : 2x :: 2x : \frac{4}{3}x =$ Parameter, and by *Emerſon*'s Fluxions, 2d Edit. P. 237,

$$2 \times \frac{2x}{\frac{4x}{3}} \sqrt{\frac{4x^2}{9} + x^2} + \frac{2{,}30258 \times \frac{4x}{3}}{4} \times \text{Log.} \frac{2x + \sqrt{\frac{4x^2}{9} + x^2}}{\frac{2x}{3}} = 7{,}53684\,x =$$

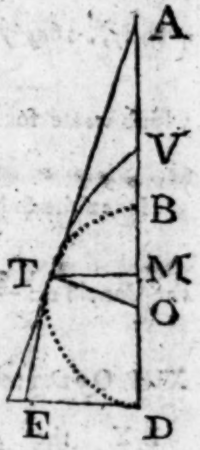
Length of the Curve HAG. Alſo $8x^2 \sqrt{\frac{1}{3}} =$ Area of the greateſt inſcribed ▭. Hence, $7{,}53684\,x = 8x^2 \sqrt{\frac{1}{3}}$; ſolved $x =$

$7{,}53684$

$\frac{7,53684}{8\sqrt{\frac{1}{3}}} = 1,63177$; from whence the Abſciſſa will be found 4,89531, and Ordinate 6,52708. W. W. R.

Mr. *Thomas Marſhall*, of *Blenchland*, anſwers it according to Mr. *Emerſon*'s Fluxions, in the ſame Concluſions as above, confirming the Truth of Mr. *Buddle*'s Solution. *Plaudite!*

XII. QUESTION 214, *anſwered by Mr.* Edward Johnſon, *of* Hull.



PUT the *Radius* of the Sphere OT $= r$, and the *Axis* VD of the Parab. Conoid $= x$, and let AT be a Tangent to the generating *Parabola*, and Semicircle in T; alſo let TM be perpendicular to AD. — By the Nature of the *Parabola*, OM = half the Parameter, $= \frac{p}{2}$; $\because$ VM $= x - \frac{p}{2} - r$, and TM^2 = VM $\times p$, *per Conics*; but TM$^2 = r^2 - \frac{p^2}{4}$ per 47 e. 1. Whence, $x - \frac{p}{2} - r \times p = r^2 - \frac{p^2}{4}$ $\because x = \frac{4r^2 + 4pr 4p^2}{4p}$ = VD; alſo $px =$ DE^2, and $pxx =$ a *Minimum, per Queſt. That is,* $\frac{4r^2 + 4pr + p^2}{4p} \times p =$ a *Minimum*; which put into Fluxions and reduced, gives $3p^4 + 16rp + 24p^2r^2 = 16r^4$; ſolved $p = \frac{2r}{3} = \frac{1}{3}$ BD; whence $x = \frac{8r}{3} = \frac{4}{3}$ BD. Moreover, *the Solidity of the Sphere is* $= \frac{16r^3}{3} \times ,7854$, and *the Solidity of the parabolic Conoid is* $= \frac{256r^3}{27} \times ,7854$, which are *evidently* in the *Ratio* of 1 to $\frac{16}{9}$. Q. E. D.

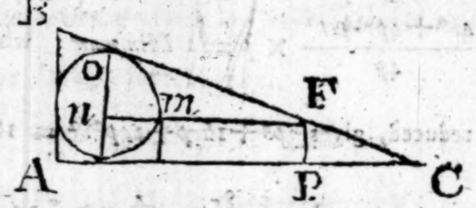
Mr. *John Buddle* anſwered this *Queſtion* in much the ſame Manner; as did the *ingenious* Mr. *Thomas Marſhall*, of *Blenchland*, very conciſely.

The ſame anſwered by the Propoſer, Mr. Paul Sharp.

LET the Axis and Semiordinate of the generating *Parabola* $= x$ and y, then the Parameter $= \frac{y^2}{x}$, and the Diameter of the Sphere $= 2y - \frac{y^2}{x}$ (*per Conics*) which put $= d$; then will $2yx - dx = y^2$, and $x = \frac{y^2}{2y - d}$ ∵ the Solidity of the Conoid $= \frac{2ay^4}{2y - d}$ (putting $a = ,7854$) which muſt be a *Minimum, per Queſt.* Conſequently, $16ay^4\dot{y} - 8ady^3\dot{y} - 4ay^4\dot{y} = 0$, whence $y = \frac{2}{3}d$; which wrote for y above, gives $x = \frac{4}{3}d$, and $\frac{y^2}{x} = \frac{1}{3}d$.

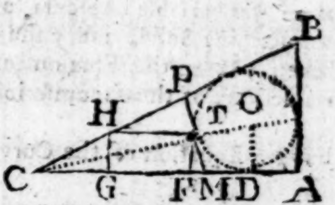
Hence the Solidity of the Sphere $= \frac{2}{3}ad^3$, and the Solidity of the Conoid $= \frac{32ad^3}{27}$, which it is *evident* are as 1 to $\frac{16}{9}$. Q. E. D.

XIII. QUESTION 215, *anſwered by the Propoſer, Mr.* John Thompſon, *of* Witherby Bridge.



BY the 47. *e.* 1. $\sqrt{\overline{AB}^2 + \overline{AC}^2} = BC = 44,7213$, and $\frac{40 + 20 - 44,7213}{2} = AE = 7,6393 = r =$ Radius of the *inſcribed* Circle. Put $AC = b$, $AB = c$, and $nE = FP = x$. Then, $On = 2r - x$, and *per* Circle, $\sqrt{2rn - x^2} = nm$; and *per* ſim. △s, $c : b :: x : \frac{bx}{c} = PC$ ∵ $b - r - \frac{bx}{c} = EP = nF$, or putting $b - r = a$, and $\frac{b}{c} = q$, we have $a - qx = nF$ ∵ $a - qx - \sqrt{2rx - x^2} = mF$, and $ax - qx^2 - \sqrt{2rx^3 - x^4} =$ a Maximum, which fluxed and divided by $\dot{x}$, &c. we have $a - 2qx = \frac{3rx - 2x^2}{\sqrt{2rx - x^2}}$, □d, $a^2 - 4qax + 4q^2x^2 = \frac{9r^2x - 12rx^2 + 4x^3}{2r - x}$, out of Fractions, and the Terms ordered, we have $x^3 - \frac{12r-4qa-8q^2r}{4+4q^2}x^2 + \frac{9r^2+a^2+8qar}{4+4q^2}x - \frac{2a^2r}{4+4q^2} = 0$; ſolved, $x = 5{,}8841$ ∵ mF $= 13{,}15176$. W. W. R.

The ſame anſwered by Mr. Edward Johnſon, *of* Hull.

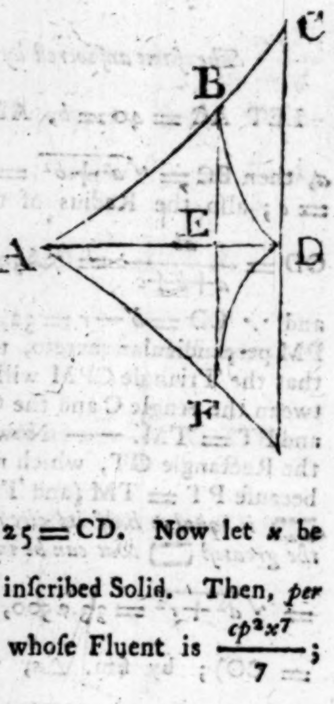


LET AC $= 40 = b$, AB $= 20 = a$, then BC $= \sqrt{a^2+b^2} = 44{,}72135 = c$; alſo the Radius of the Circle, OD $= \frac{ab}{a+b+c} = 7{,}63932 = r$; and ∵ CD $= b - r = 32{,}3606 = d$. —— Let CO be drawn, and PM perpendicular thereto, touching the Circle in T; then it is plain, that the Triangle CPM will be the *greateſt* that can be formed between the Angle C and the Circle; becauſe CO biſects the Angle C, and PT = TM. —— Now draw TH parallel to AC, and compleat the Rectangle GT, which muſt be equal to half the Triangle CPM; becauſe PT = TM (and TH parallel to AC). —— But *the greateſt* ▭ *is equal to half its circumſcribing Triangle, and therefore* GHTF *is the greateſt* ▭ *that can be inſcribed, as per Queſtion.* — Whence, CO $= \sqrt{d^2+r^2} = 33{,}2500$, and CT $= m - r = 25{,}6107$ (m being = CO); by ſim. △s, we have $m : r :: m-r : \frac{\overline{m-r}\times r}{m} = 5{,}8842$ = FT, the Breadth of the ▭; and putting FT $= e$, we have $\frac{\overline{b-r}\times e}{r} = 24{,}9258$ = FC, alſo $\frac{bc}{a} = 11{,}7684$ = GC; and thence FC — GC = GF or TH $= 13{,}1574$ the Length of the ▭; whence the greateſt Area $= 77{,}42$, &c. W. W. R.

☞ No other Correſpondents ſolved the ſame Queſtion *numerically* true. But Mr. *John Buddle* anſwered the ſame Queſtion *analytically*, without bringing out the Numbers; as did Mr. *Marſhall*, of *Blenchland*; who *methodically* and *numerically* anſwered moſt of the Queſtions.

Mr. *Johnſon*, of *Hull*, anſwered the 1, 4, 5, 6, 8, 9, 12, 13, 15, 20, 22, 23, 25, 26, 27, 28, and *Prize* Queſtions.

XIV. QUESTION 216, *anſwered* only *by* Mr. John Thompſon, *of* Witherby Bridge.



BOTH theſe *Curves* will be found convex towards the Axis. Hence, putting 16065 = s; 30 = n; c = 3,1416, x = any variable Abſciſſa of the circumſcribing Solid, and y the Ordinate. Then $cy^2\dot{x}$ = the Fluxion of any variable Part of the circumſcribing *Solid*; but *per* Equation of the Curve $p^{\frac{2}{3}}x^{\frac{8}{3}} = y^2$ ∴ $cp^{\frac{2}{3}}x^{\frac{8}{3}}\dot{x}$ = Fluxion of the Solid; whoſe Fluent is $\frac{cp^{\frac{2}{3}}x^{\frac{8}{3}+1}}{\frac{8}{3}+1} = \frac{3cxy^2}{11}$, and when $x = n$, y = CD ∴ $\frac{3cny^2}{n} = s$, and $y = \sqrt{\frac{11s}{3cn}}$ = 25 = CD. Now let x be any *Abſciſſa*, and y the Ordinate of the inſcribed Solid. Then, *per* Curve, $cp^2x^6\dot{x}$ = Fluxion of the Solid, whoſe Fluent is $\frac{cp^2x^7}{7}$; but, *per* Curve, $x^6 = \frac{y^2}{p^2}$ ∴ $\frac{cxy^2}{7}$ = Solidity of any variable Part of the inſcribed *Solid*. And when x = DE, y = BE ∴ $\frac{C\times DE\times DE^2}{7}$ = the *Solidity* of the inſcribed Solid BDFE. Hence, put DC = 25 = m; and AE = v, then DE = $n - v$, and $n^4 : m^3 :: v^4 : BE^3 = \frac{m^3v^4}{n^4}$, ∴ $\frac{nv^{\frac{4}{3}}}{n^{\frac{4}{3}}}$ = BE, and $\frac{m^2v^{\frac{8}{3}}}{n^{\frac{8}{3}}} = BE^2$ ∴ $\frac{cm^2v^{\frac{8}{3}}}{7n^{\frac{8}{3}}} \times \overline{n-v}$, or $v^{\frac{8}{3}} \times \overline{n-v}$ = a Maximum. Fluxed $\frac{8\dot{v}v^{\frac{5}{3}}}{3} \times \overline{n-v} - \dot{v} \times v^{\frac{8}{3}} = 0$. Divided by $\dot{v}v^{\frac{5}{3}}$ we have $\frac{8n-8v}{3} - v = 0$ ∴ $v = \frac{8n}{11}$, and $n - \frac{8n}{11}$ = DC = $\frac{3n}{11}$ = 8,1818 ∴

$m\times$

$$\frac{m \times \overline{\frac{8n}{11}}\Big|^{\frac{4}{3}}}{n^{\frac{4}{3}}} = BE = \frac{m \times \overline{\frac{8}{11}}\Big|^{\frac{4}{3}} \times n^{\frac{4}{3}}}{n^{\frac{4}{3}}} = m \times \overline{\frac{8}{11}}\Big|^{\frac{4}{3}} = ,65403m$$

$= 16,35075$, and the Solidity $= 981,696094$. W. W. R.

XV. QUESTION 217, *anſwered by Mr.* William Chapman, *of* Foxton, Leiceſterſhire.

PUT x for Sine of the Sun's Declination, y its Coſine, p for Sine of the Sun's Meridian Altitude, q its Coſine, t for Cotangent of 9° half the Depreſſion, then we have $qy - px$ for Sine of Latitude. And, by Writers on Fluxions, $t : 1 :: qy - px : x$, and $tx = qy - px$, therefore $y = \frac{tx + px}{q}$, for $\frac{t + p}{q}$ put m, then $y = mx = \sqrt{1 - x^2}$, and $m^2x^2 = 1 - x^2$. Therefore $x = \sqrt{\frac{1}{m^2 + 1}} =$,13662, the natural Sine 7° 51′ 10″, and the Latitude is 59° 35′ 52″ N. And *Feb.* 28, or *Oct.* 13, the Days when the Evening Twilight is ſhorteſt, required.

The ſame anſwered by Mr. Edward Johnſon, *at* Hull.

PUT $a =$ S. 22° 23′, the given Altitude, $b =$ its Coſine, $t =$ Tan. 9°, half Sun's Depreſſion below the Horizon; and let x and y denote the Sine and Coſine of the Sun's Declination; then the Sine of the Latitude will be $by - ax$. Now, by an univerſal Proportion for finding the Declination when the Twilight is ſhorteſt, (Radius being 1.)

As $1 : by - ax :: t : x$, whence $x = byt - atx$, and $\frac{x}{y} = \frac{bt}{1 + at} =$,13789, the Tangent 7° 51′, Sun's Declination South, anſwering to *February* 28, and *October* 13, the Days required. — Whence, by taking the Declination from the Complement of the given Altitude, we get 59° 36′ for the Latitude N. W. W. R.

Mr. *Sanderſon*, of *Harborough*, anſwered the ſame in the foregoing Manner and Numbers.

XVI. QUESTION 218, *anſwered by* Nobody, *not even by the Propoſer, Mr.* Thomas Harris, *of* Bugbrook.

☞ Thus we ſee the Conſequence of obliging neglectful Correſpondents; by inſerting their Queſtions without Anſwers ſent.

In what North Latitude will *Sirius* ſet with *Aldebaran* in the Year 1762? [Now ſuppoſe 1763.]

The eaſieſt Method of Solution is to aſſume the Latitude, and try the Conſequence till it correſponds.

Our Reader will excuſe us for not having Time to perform all Solutions, for Others, more *laborious* than *difficult*, and leſs *uſeful* than *curious.*

XVII. QUESTION 219, *anſwered by Mr.* Williams, *of* Hackney, *the Propoſer.*

Diameter and Sides 1 Inch.	Weight Troy. oz.	Worth at 4 *l.* *per* Ounce Troy. £.	£.	s.	d.
Globe	5.218482	20.873930	20	17	6 $\frac{1}{2}$
Tetrahedron	1.174106	4.696425	4	13	11
Octahedron	4.696426	18.785705	18	15	8 $\frac{1}{2}$
Hexahedron	9.962625	39.850500	39	17	0
Icoſahedron	21.735409	86.941636	86	18	9 $\frac{3}{4}$
Dodecahedron	76.344781	305.379123	305	7	6 $\frac{3}{4}$

Cheſterfieldienſis gives the Worth exceeding near.

Mr. *John Buddle*, of *Cheſter-le-ſtreet*, alſo anſwered the above Queſtion, very nearly in the ſame Numbers, confirming the Truth of Mr. *Williams*'s Solution; from which ſeveral other of our Correſpondents very erroneouſly and widely differ, — except Mr. *Marſhall*, of *Blenchland*, whoſe Numbers alſo are correct, as they are in general *to all his Solutions*. Mr. *Alexander Rowe* gave a true *Method* and nearly true Numbers.

XVIII. QUESTION 220, *anſwered by Mr.* P. Antrobus.

BY the *Theorem* in *Ladies Diary* for the Year 1737, you have the following RULE. *To twice the Square Root of the Sum of the Squares of the tranſverſe and conjugate Diameters, add one third Part of the conjugate Diameter, and the Sum will be the Periphery of the Ellipſis, within an Hundredth Part of the whole.*

From whence 30 ſquared and 40 ſquared, the Sum of their Squares is 2500, the Square Root of which is 50, which doubled and added to one third of the conjugate Diam. 30, = 10, gives the Circumference 110. W. W. R.

Mr. Williams, *the Propoſer, gives the ſame Anſwer following.*

BY *Simpſon*'s *Fluxions*, P. 127, the Circumference is 110.6469732, which I think is near the *Truth.*

Mr. *William Kernot*, at *Wincheſter*, anſwers it thus; $\frac{40+30}{2} \times 3{,}1416 = 109{,}956$, the Circumference required, which is a *near Rule.*

Mr. *Thomas Walker* ſays, at P. 260, *Robertſon*'s *Menſuration*, $\frac{30}{40} = {,}75$, againſt which (in the Tab. at P. 259) is 2,7599, which multiplied by $40 = 110.396$, the required *Periphery*, nearly as before.

Mr. *William Chapman*, of *Foxton*, *Leiceſterſhire*, anſwered the ſame; who likewiſe anſwered the 18th *Queſtion* in the *Ladies Diary* for 1761.

Mr. *John Buddle*, of *Cheſter-le-ſtreet*, anſwered the 18th Queſtion in the *Palladium* the ſame: as before.

Mr. *Thomas Marſhall*, of *Blenchland*, anſwered the ſame by *Holiday*'s Gunnery, $2\sqrt{\overline{40}^2+\overline{30}^2}+\frac{20}{3}=110$, the Periphery; or (by *Emerſon*'s *2d Edition* of his *Fluxions*, *P.* 241) 110.396, and the ſame by *Robertſon*'s *Menſuration*. See alſo *Emerſon*'s Fluxions, 1ſt Edit. P. 173, 174.

The ſame was anſwered by Mr. *W. Wells*, of *Howden*, *Yorkſhire*, and ſome others.

XIX. Question 221, *anſwered by the Propoſer*, *Mr.* Paul Sharp.

PUT the Area of the *circular* Hole $=a=,005454$, $b=16\frac{1}{12}$, $c=1,5$, and $x=$ the Diameter, then $x+c=$ Depth each in *Feet*. Alſo let $m=,7854$, $n=$ the Seconds in 16,1585234 *Minutes* $=969,511404$. — Now, by the Laws of *Hydroſtatics*, we have this Equation, *viz.* $\frac{2mx^3+2mcx^2}{a\sqrt{2bx+2bc}}=n$. Which ſquared and reduced, gives $x^6+2cx^5+c^2x^4-\frac{a^2n^2bx}{2m^2}=\frac{a^2n^2cb}{2m^2}$; which, brought into Numbers, and ſolved, gives $x=3$ Feet, the Cylinder's Diameter, ∴ the Depth is $=4,5$ Feet, and the Content $=31,8087$ ſolid Feet $=194,91289$ Ale *Gallons*. W. W. R.

Mr. *William Chapman*, of *Foxton*, *Leiceſterſhire*, analytically anſwered the ſame; but without bringing out the Numbers.

XX. Question 222, *anſwered by Mr.* Paul Sharp, *the Propoſer*.

PUT $a=86,52653$, $b=,630547$, $c=3,1416$, and $3x=$ the Abſciſſa, $2x=$ the Semiordinate. Then, $\frac{4x}{3}=$ the *Parameter*, and $\frac{8x}{3}=$ the Diameter of the *inſcribed* Circle, *per Conics*. And becauſe the Abſciſſa is to its Semiordinate as 3 to 2, we have $\frac{8cx-4bx}{3}=$ the Length of the Curve (*per* Prob. 17. in *Pallad.* 1760) ∴ $\frac{8cx-4bx}{3}+4x=a$, *per* Queſt. which, reduced, gives $x=\frac{3a}{8c-4b+12}=7,5 \therefore 3x=22,5=$ the Abſciſſa; $4x=30$

=

= the Ordinate, and the Area = 450 Square Poles, required.

Mr. *John Buddle*, of *Cheſter-le-ſtreet*, elegantly and truly anſwered the ſame *Queſtion*; as did Mr. *Thomas Marſhall*, of *Blencbland*, who finds the very ſame Concluſions with the Propoſer's.

The ſame anſwered by Mr. Alexander Rowe.

BY a known *Theorem*, the Curve of a *Parabola*, whoſe Abſciſſa is 3 and Semiordinate 2, is $= 3.7684 = c$, and let $x =$ Abſciſſa of the required *Parabola*. Then, by Similarity of Figures, $3 : 2 :: x : \frac{2x}{3} = \frac{1}{2}$ required Ordinate; and $3 : c :: x : \frac{cx}{3} = \frac{1}{2}$ the required Curve. Therefore $\frac{4x}{3} + \frac{2cx}{3} = p$ (putting $p = 86.52653$.)

Whence $x = \frac{1{,}5p}{2+c} = 22.5$; Ordinate $= 30$, and Area $= 450$ Square Poles. W. W. R.

The ſame anſwered by Mr. Edward Johnſon, *of* Hull.

PUT $a = 86{,}52653$, $x =$ Abſciſſa, $y =$ Semiordinate, and $p =$ Parameter of the *Parabola*. Then, *per Queſt.* $3 : 4 :: x : 2y$, $\therefore x = \frac{3y}{2}$; alſo we have $px = y^2$ by Nature of the Curve, and therefore $p = \frac{y^2}{x} = \frac{2y}{3}$. But $\frac{a-2y}{2} =$ half the Length of the Curve; and by a well known *Theorem*, we have

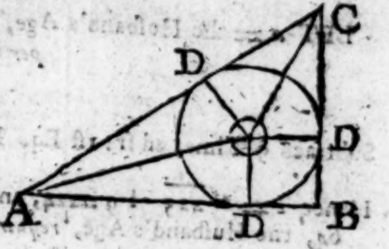
$$\frac{\frac{1}{2}y\sqrt{\frac{y^2}{9}+y^2}}{\frac{1}{3}y} + \frac{y}{6} \times \text{Hyp. Logar.} \frac{y+\sqrt{\frac{y^2}{9}+y^2}}{\frac{1}{3}y} = \frac{a-2y}{2}.$$

Or, $\frac{y\sqrt{10}}{2} + \frac{y}{6} \times$ Hyp. Log. $\overline{3+\sqrt{10}} = \frac{a-2y}{2}$.

put Hyp. Log. of $\overline{3+\sqrt{10}} = 1{,}81844 = m$, then $\frac{y\sqrt{10}}{2} + \frac{my}{6} = \frac{a-2y}{2}$, which reduced gives $y = \frac{3a}{3\sqrt{10}+m+6} = 15$; and conſequently $x = \frac{3y}{2} = 22{,}5$; and $\frac{4xy}{3} = 450$ Square *Poles*, the Area *required*.

XXI.

XXI. QUESTION 223, *anſwered by the Propoſer, Mr.* Paul Sharp, *of* Biddenden.



LET ACB be the Triangle, and O the Center of the *inſcribed* Circle; from which draw the *Radius* to the Points of Contact D, which put $= a = 1,80252$, $b = 2,09845$. Now, *per* 4. E. 4. the Sum of the Angles ACO + CAO = 45°, the natural Sine and Coſine of half which call s and q; and the Sine and Coſine of $\frac{1}{2}$ their Difference call x and y; Radius $= 1$. —— Then will $sy+qx =$ S. ∠ ACO, $sy-qx =$ S. ∠ CAO; and, *per Trigon.* as $sy-qx : a :: 1 : \frac{a}{sy-qx} =$ AO; alſo $sy+qx : a :: 1 : \frac{a}{sy+qx} =$ CO. Conſequently, $\frac{a}{sy-qx} - \frac{a}{sy+qx} = b$, *per Queſt.* Which Equation reduced gives $2aqx = bs^2y^2 - bq^2x^2$, in which write $1-x^2$ for y^2, and we have $bs^2x^2 + bq^2x^2 + 2aqx = bs^2$; but $s^2+q^2=1$, per 47. *e.* 1. $\therefore bx^2 + 2aqx = bs^2$, or $x^2 + \frac{2aqx}{b} = s^2$. Whence $x = \sqrt{s^2 + \frac{a^2q^2}{b^2}} : -\frac{aq}{b} = ,08744$, anſwering, in the Tables, to 5° 1′; which added to and taken from 22° 30′ gives 27° 31′ = ∠ACO, and 17° 29′ = ∠CAO; whence the Hypothenuſe AC $= 9,18295$; the Baſe AB $= 7,52532$, and Perpendicular BC $= 5,26267$. W. W. R.

The *indefatigable Cheſterfieldienſis* has given an *analytical* Solution to the foregoing Queſtion in a *final* Equation, involving Surd Quantities; but as the Numbers are not determined anſwering thereto, we omit to inſert the Method.

Mr. *Thomas Sadler* finds the Hypothenuſe 9.06329, Baſe = 7.41089, Perpendicular 5.31244.

Mr. Alexander Rowe's *Anſwer.*

PUT $3.60504 = 2a$; $2.09845 = 2b$; and $x = \frac{1}{2}$ Sum of the Lines drawn from the Center to the acute ∠s; then $x+b =$ AO; $x-b =$ OC; and $a =$ OD, *per* Fig. — Now, $\sqrt{\overline{x+b}^2 - a^2} =$ AD; and $\sqrt{\overline{x+b}^2 - a^2} + a =$ AB. —— And, in the ſame Manner, $\sqrt{\overline{x-b}^2 - a^2} + a =$ BC; and $\sqrt{\overline{x+b}^2 - a^2} + \sqrt{\overline{x-b}^2 - a^2} =$ AC. But $\sqrt{\overline{x-b}^2 - a^2} : + a = 3a$; ſolved, $x = 5.079782$; whence AB $= 7.66047$; BC $= 5.40756$, and AC $= 9.46299$ *(if there is no Miſtake.)* W. W. R.

XXII. QUESTION 224, *anſwered by Mr.* Pennington, *of the* Cheſhire *Militia.*

LET $a =$ the Huſband's Age, and e equal the Wife's Age, then *per* Queſt. $9a = ee$

$$a - 2e = 16$$

Subtract 9 Times 2d fr. 1ſt Eq. Hence $18e = ee - 144$

Hence $e = \sqrt{225} + 9 = 24$, and $a =$ 64, the Huſband's Age, *required.* } $ee - 18e = 144$ Comp. □: [extr. Root.

The ſame anſwered by Mr. P. Antrobus. Put $a =$ the Huſband's Age, $e =$ the Lady's, and $b = 16$. —— Then $9a = ee$, and $a - 2e = b$, *per Queſt.* Whence, $8 + b = 24 = e =$ the Lady's Age; and $2e + b = 64$, the Huſband's Age; a very *unequal* Match.

Mr. *William Kernot*, of *Wincheſter*, anſwers it in a *ſimilar* Manner; as did Mr. *Thomas Vanner*, of *Sunbury, Middleſex*; Mr. *John Clark*, of *Lincoln*; Mr. *N. Spooner*, of *Newmarket*; Mr. *Thomas Holland*, of *Marbury*; Mr. *John Smith*, of *Hexham*; and Mr. *W. Wells*, of *Howden, Yorkſhire.*

Mr. Edward Johnſon, *of* Hull, *anſwers it thus.*

LET $x =$ the Huſband's Age, $y =$ the Wife's Age; then, *per* Queſt. $9x = y^2$, and $x - 2y = 16$, here $\frac{y^2}{9} = 16 + 2y$, whence $y = 24$, and $x = 64$. W. W. R.

Mr. *Lyon*, of *Margate, Kent*, alſo anſwered it elegantly as before; as did Mr. *William Chapman*, of *Foxton, Leiceſterſhire.*

Mr. *John Buddle*, of *Cheſter-le-ſtreet*, ſolved it, who obſerves,

What can old Froſty *do with ſuch a Wife?*
Youth tied to Age palls all the Joys of Life.

Cheſterfieldienſis has elegantly and conciſely anſwered the ſame; as did Mr. *Alexander Rowe*, Mr. *Thomas Sadler*, and ſeveral Others.

XXIII. QUESTION 225, *anſwered by Mr.* Edward Johnſon, *of* Hull.

FIRST, we have $44° 11' - 40° 59' = 3° 12'$, the Increaſe of the Sun's Declination in 10 Days.

But, on *April* 21, 1761, Declination was 12° 2′ N.
On *May* 1, 1761 . . 15 14 N.

Diff. 3 12
Which agrees with the above.

And therefore, Zenith Diſt. *May* 1, being 45° 49′ } add
Declination then 15 14

Latitude is 61 3 N.

And the Days of Obſervation as above.

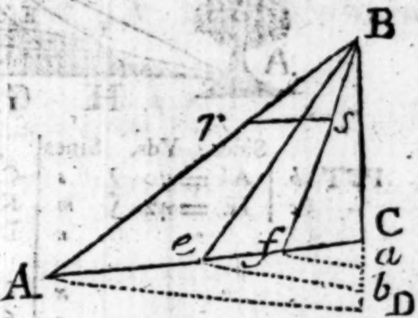
Mr. John Buddle *goes to work thus.*

FIRST 44° 11′ — 40° 59′ = 3° 12′, the Increaſe of Declination in 10 Days; then ſeeking in the *Tables* of Declination for the *Spring* Quarter, till I find 3° 12′ Increaſe, anſwer to 10 Days ſince, which is between the 21ſt of *April* and the 1ſt of *May*, which are the required Days, the Declination on the former being 11° 56′ N. and on the latter 15° 8′ N. from which the Latitude of the Place is found 60° 57′ N. *being a near Anſwer.*

Mr. *Thomas Marſhall*, of *Blenchland*, anſwers the ſame by a final *analytic Equation*, which ariſes to a double Quadratic, and ſolved gives the Latitude as above.

Mr. *Alexander Rowe proceeds thus.* — Put a = S. 40° 59′; s and c = S. and Coſ. 22° 5′ 30″; x and y = S. and Coſ. ½ Diff. of Co-Lat. and Declination. — Then $cy-sx$ = S. Lat. and $sy-cx$ S. Declination. Whence, *per Spherics*, 1 (= Rad.) : $sy-cx$ :: $cy-sx$: a; ∴ $scy^2-s^2yx-c^2yx+csx^2=a$; but x^2+y^2, and s^2+c^2 are each = 1, from whence the *Requiſites* may be eaſily found.

XXIV. QUESTION 226, *anſwered by Mr.* T. Vanner, *of* Sunbury, Middleſex.



LET BC be the Tower's Altitude, AC the Slope, Ae = 70 Yards, and ef = 42 Yards. Then, *per* Queſt. the Angles BAD = 30°, Beb = 40°, Bfa = 50°. Conſequently ∠s ABe = 10°, eBf = 10°, and ∠ABf = 20°.

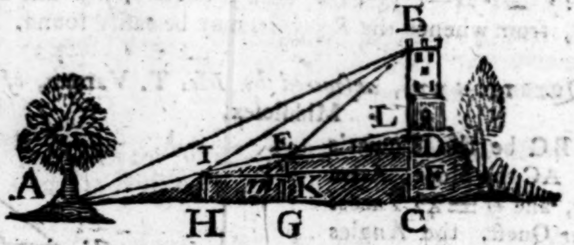
Call the S. ∠BeC, or BeA, x; S. ∠eBf, a; (= eBA;) the *Line* AA, u; and Line Bf, y; then, *per Trig.* as 70 : a :: u : $x=\frac{au}{70}$. And, As 42 : a :: y : $x=\frac{ay}{42}$ ∴ $\frac{au}{70}=\frac{ay}{42}$. Hence, this *Analogy*; As u : y :: 70 : 42. Draw rs ∥ AC; let rB = 70, and Bs = 42; then, as rB + Bs (= 112) : rB − Bs (= 28) :: Tang. $\angle\frac{r+s}{2}$ (= 80°) : *Tang.* ½ Diff. (= 54° — 48′). Hence ∠BAC = 25° 12′. Now, as S. 10° (= ∠ABe) : 70 (= AC) :: 35° 12′ (*ſupplemental* ∠ AeB : 232,3 (= AB). And as S. 85° 12′ (ſupplemental ∠ ACB) : 232,3 :: S. 25° 12′ (= ∠BAC); 99,28 Yards = BC, the *Tower*'s Altitude *required.*

N. B. *The* ∠CAD = 4° 55′, *whereby* CD = 16,92, *conſequently the whole Height*, BD, *from the horizontal Plane is* 116,2 *Yards.*

Mr. *Alexander Rowe* ſays — " I apprehend it is impoſſible to give a " *ſtrictly* true Solution to this Queſtion, becauſe the Property of the " *riſing Plane* is not at all expreſſed. — But ſuppoſing the *Plane*'s " *Height*, on which the Tower ſtands, be equal to that of the Ob- " ſerver's Eye from the *horizontal* Plain, (in which Caſe the Data 42 " is inſignificant;) then, in the 3 plane Triangles, the 3 ∠s in each " of them are given, and a Side in one. Therefore, operating *tri-* " *gonometrically*, I find the *Tower*'s Height = 129.56 Yards." —— Who farther ſays,

" N. B. *I do not pretend to judge for any other Perſon than myſelf*; " *neither do I queſtion the Lady's* Abilities *who propoſed the* Queſtion, " *which doubtleſs are very great*."

The ſame Queſtion anſwered by Cheſterfieldienſis.



PUT	Sides.	Yds.	Sines	∠s
b	AI	= 70	s	CAB = 30°
c	IE	= 42	m	KIB = 40
			n	DEB = 50
			x	IAH, Coſ. = $\sqrt{1-xx}$,
			t	60°.
			g	ABI = IBE.

By a well known Theorem, $s\sqrt{1-xx}-xt=$ S. ∠IAB.

As $g : b :: s\sqrt{1-xx}-xt : \dfrac{bs\sqrt{1-xx}-btx}{g}=$ BI.

$1 : b :: x : bx=$ IH; and $1 : b :: \sqrt{1-xx} : b\sqrt{1-xx}$ [= AH.

Again, $b : bx :: c : cx=$ EK; and $b : b\sqrt{1-xx} :: c : c\sqrt{1-xx}$ [= IR.

Alſo $n : cx :: m : \dfrac{cmx}{n}=m$K, and $c\sqrt{1-xx}-\dfrac{cmx}{n}=$ Im.

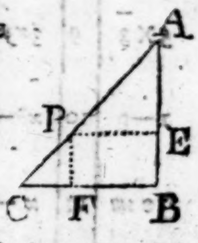
$g : c\sqrt{1-xx}-\dfrac{cmx}{n} :: n$; BI. Whence, $nc\sqrt{1-x^2}$

—

$-cmx = bs\sqrt{1-xx} - btx$, from above. Put $bs = p = 35$; $bt = 60,621778 = b$, $nc = 32,1738648 = f$; and $cm = 26,9970792 = k$; and $p\sqrt{1-xx} - bx = f\sqrt{1-xx} - kx$; put $p - f = l$; $b - k = g$; hence $x = \sqrt{\frac{l^2}{l^2+q^2}} = ,083754$, anſwering to 4° 48′; whence, 30° − 4° 48′ = 25° 12′ = BAL; and 25° 12′ + 20° (∠ABE) + 40° (∠EBL) = 85° 12′, ∠ALC; whence the *Tower*'s Height is = 99,285 Yards, *confirming the Truth of Mr.* T. Vanner'*s Solution. Plaudite!* W. W. R.

Mr. *John Buddle*, of *Cheſter-le-ſtreet*, by an elaborate Proceſs, and final Equation involved with Surds, but reduced to a ſimple Equation, in Numbers, $13.6923178\,x = 2.371718928524$; finds $x = ,1732146$ = Nat. Tan. 9° 49′ 14″ 46‴ = ∠IAH; from which, by Trigonometry, he finds the Tower's Height to be 70,8975 Yards only; which elaborate Solution we wiſh him to *reviſe*.

XXV. QUESTION 227, *anſwered by Mr.* Edward Johnſon, *of* Hull.



PUT s = natural Sine ∠C (48° 30′), $a = 16\frac{1}{12}$ Feet, d = AC, the whole Length of the Plain; alſo put x = AP, where P is the Point required, then PC $= d - x$. Now draw PE parallel to CB, and PF to AB; and we have AE $= sx$, by Trigonometry, and $\sqrt{\frac{sx}{a}}$ = Time in which a heavy Body would freely deſcend from A to E; and its Velocity at E or P is $= \frac{2a\sqrt{sx}}{\sqrt{a}}$, or $2\sqrt{asx}$. Moreover, by Mechanics, let the Weight of the Body be what it will, its Effect upon the Plain will be expreſſed by AP × PC × Body's Velocity, that is, by $x \times \overline{d-x} \times 2\sqrt{asx} = \overline{dx^{\frac{3}{2}} - x^{\frac{5}{2}}} \times 2\sqrt{as}$, a Maximum by the Queſtion. In Fluxions $\frac{3dx^{\frac{1}{2}}\dot{x}}{2} - \frac{5x^{\frac{3}{2}}\dot{x}}{2} = 0$. —— Whence $x = \frac{3d}{5}$, that is, AP $= \frac{3\text{AC}}{5}$, and PC $= d - x = \frac{2d}{5} = \frac{2\text{AC}}{5}$, and conſequently 3 : 2 :: AP : PC. W. W. R.

XXVI. QUESTION 228, *curiouſly anſwered by Mr.* Thomas Vanner, *of* Sunbury, Middleſex.

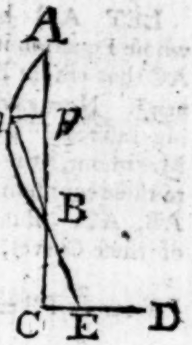
	1	$x^2+xy+y^2=a$	*Per* Queſt. is given, to find a *Theorem* for x and y.
	2	$x^4+x^2y^2+y^4=b$	
2÷1	3	$x^2-xy+y^2=\frac{b}{a}$.	
1−3	4	$2xy=\frac{a^2-b}{a}$.	
4÷$\bar{2}$	5	$xy=\frac{a^2-b}{2a}$.	
3+5	6	$x^2+y^2=\frac{a^2+b}{2a}$.	
6+4	7	$x^2+2xy+y^2=\frac{3a^2-b}{2a}$.	
7 w	8	$x+y=\sqrt{\frac{3a^2-b}{2a}}$.	
5×$\bar{3}$	9	$3xy=\frac{3a^2-3b}{2a}$.	
1−9	10	$x^2-2xy+y^2=\frac{3b-a^2}{2a}$.	
10 w	11	$x-y=\sqrt{\frac{3b-a^2}{2a}}$.	
8+11	12	$x=\sqrt{\frac{3a^2-b}{8a}}+\sqrt{\frac{3b-a^2}{8a}}$.	
8−11	13	$y=\sqrt{\frac{3a^2-b}{8a}}-\sqrt{\frac{3b-a^2}{8a}}$.	W. W. R.

☞ *This Queſtion was propoſed by Mr.* Joſeph Wooſe, *at Mr.* Johnſon's *School of* Hull, *in* Martin's Magazine *for* April 1759, *and ſolved in* Auguſt *following, by a Quadratic of the* 3d Form. —— And may, it ſeems, be ſolved by a ſimple Equation.

Mr. *John Buddle*, of *Cheſter-le-ſtreet*, ſolved it as above.

Mr. *Johnſon*, of *Hull*, the Propoſer, Mr. *William Chapman*, of *Foxton*, *Leiceſterſhire*, Mr. *Paul Sharp*, of *Biddenden*, *Kent*, *Cheſterfieldienſis*, and *Mr. Thomas Sanderſon*, of *Harborough*, anſwered it in a ſimilar and elegant Manner.

XXVII. QUESTION 229, *anſwered by Mr.* Edward Johnſon, *of* Hull.

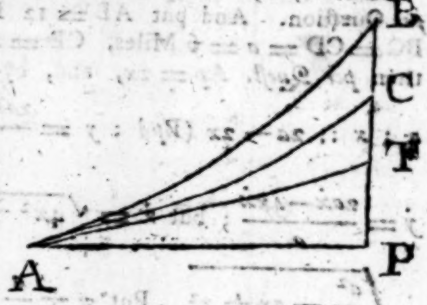


LET A, B, C, repreſent the three Ships as *per* Queſtion. And put AB $= 12$ Miles $= 2a$, BC $=$ CD $= a = 6$ Miles, CE $= x$, $pm = y$; then *per Queſt.* $Ap = 2x$, and, by ſimilar Δs, $a : x :: 2a - 2x$ (Bp) $: y = \frac{2ax - 2x^2}{a}$; and $\dot{y} = \frac{2a\dot{x} - 4x\dot{x}}{a}$; but $\dot{z} = \sqrt{4\dot{x}^2 + \dot{y}^2} = \frac{4\dot{x}}{a} \sqrt{\frac{a^2}{2} - ax + x^2}$. Put $v + \frac{a}{2} = x$, and $\because$ $\dot{v} = \dot{x}$, and $\dot{z}$ becomes $\frac{4\dot{v}}{a} \times \sqrt{\frac{a^2}{4} + v^2}$, the Fluxion of the Curve Am; whoſe Fluent, by Mr. *Emerſon*'s Forms, is $z = \frac{1}{2} v \sqrt{\frac{a^2}{4} + v^2} + \frac{a}{2} \times$ Hyp. Log. $v + \sqrt{\frac{a^2}{4} + v^2}$, which corrected, by making $v\ v = -\frac{a}{2}$, and then the whole Length of the Curve, or Diſtance ſailed by the Ship A, when ſhe arrives at B, (x being then $=$ CD $= 6$ *Miles*) is $z = 9\sqrt{2} + 3 \times$ Hyp. Log. $2 = 14.8078$ Miles. W. W. R.

Mr. Alexander Rowe's *Anſwer.* —— From the *Data*, I find the *Track* deſcribed by the *Merchant-Man* to be a ſemi-parabolic Curve, whoſe ſemi-tranſverſe Axis $= 6$, and Semi-conjugate $= 3$ *Miles*, the *Equation* of which Curve is $ax = y^2$; in Fluxions $\dot{x} = \frac{2y\dot{y}}{a}$; whence $\dot{z} = \sqrt{\dot{x}^2 + \dot{y}^2} = \frac{\dot{y}}{a}\sqrt{aa + 4y^2}$; whoſe corrected *Fluent* is $z = \frac{y}{a}\sqrt{\frac{1}{4}aa + y^2} + \frac{2.30258\,a}{4} \times \text{L.}\, \frac{y + \sqrt{\frac{1}{4}aa + y^2}}{\frac{1}{2}a}$ $= 6.97$ (where $a = 1.5$ the *Parameter*, and when y becomes $= 3$,) which $\times$d by $2 = 13.94$ Miles required. W. W. R.

N. B. *This Curve may be conſtructed by Points.*

XXVIII. QUESTION 230, *anſwered (for Mr.* Brown, *of* Portſmouth Common) *by* Newtonienſis.



LET AB be the Curve, whoſe Equation is $ax^3=y^2$, and AC that whoſe Equation is $px^4=y^3$. Now, when ACP, being inſcribed in ABE, is a Maximum, the *Tangent* AT muſt be common to both Curves, AB, AC. But by the Nature of theſe Curves, the *Subtangent*

$$PT=\frac{2}{3}PB=\frac{3}{4}PC.\text{ And}$$

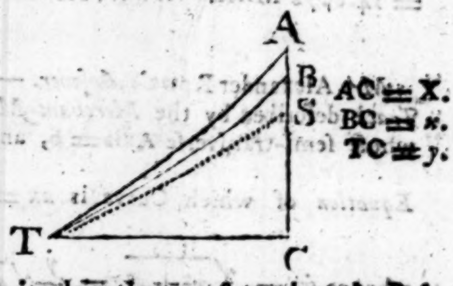
$$PC=\frac{8}{9}PB=\frac{8}{9}\times 50=44\frac{4}{9}.$$

Laſtly, the Solidity of APC (revolving about CP) will be $3.1416\times\frac{3}{11}AP^2\times PC$. (*See* Ex. 5. Prob. 14. *of* Emerſon's Fluxions.)

W. W. R.

Mr. *Brown*, of *Portſmouth-Common*, not ſending us a Solution to his *own Queſtion*, as he promiſed to do if we obliged him by inſerting it, we are to ſuppoſe him incapable of giving one, in not performing it; we being obliged to ſupply a Solution for him.

Anſwer by Mr. Edward Johnſon.



BY the Nature of the Queſtion, the two Curves muſt either touch at the Vertex, or at the Baſe. But, in the preſent Caſe, ſince the Curve to be inſcribed ($px^4=y^3$) has its Curvature at the Vertex infinitely leſs than the other Curve (ſee *Emerſon*'s Fluxions, Ex. 6. Prop. 5.) and therefore can never fall within it, it is plain they muſt touch at the Baſe, and have one common Semi-ordinate TC, and the ſame Tangent ST.

Now from the Nature of the Curve AT, whoſe Equation is $aX^3=y^2$, we get the Subtangent $CS=\frac{2X}{3}$; and from the Nature of the Curve BT, whoſe Equation is $px^4=y^3$, we get the Subtangent $CS=\frac{3x}{4}$, by the Method of drawing Tangents. Whence

3x

$\frac{3x}{4}=\frac{2X}{3}$, and $x=\frac{8X}{9}=BC$, the Height of the inſcribed Solid; which, when $X=AC=50$, becomes $=44\frac{4}{9}=BC$; and as they both have the ſame Semi-ordinate $(y=70)$, the Dimenſions are found. —— To find the Content of the inſcribed Solid, put $d=3{,}1416$, then from the Equation of the Curve $(px^4=y^3)$, $y^2=p^{\frac{2}{3}}x^{\frac{8}{3}}$, and $\because dy^2\dot{x}=dp^{\frac{2}{3}}x^{\frac{8}{3}}\dot{x}$ the Fluxion of the Solidity; whoſe Fluent is $\frac{3dp^{\frac{2}{3}}x^{\frac{11}{3}}}{11}=\frac{3dy^2x}{11}$, the Solidity required; which appears to be $\frac{3}{11}$ of its circumſcribing Cylinder, $=186592$. —— In the ſame Manner the Content of the Solid whoſe Abſciſſa $=50$, and Semi-ordinate $=70$, and Equation $aX^3=y^2$, will be found $=\frac{dy^2X}{4}=192432$. W. W. R.

XXIX. QUESTION 231, *anſwered by the* AUTHOR *of the* Royal Aſtronomer and Navigator.

BY P. 211, *Jones*'s *Synopſis Palmariorum*, let $x=1.025$, the Amount of 1 £. and its Intereſt at 5 *per Cent.* then $\frac{x^n \times \overline{x-1} \times s}{x^n-1}$, the Value of a ½ yearly Penſion, payable for *n* half Years, for *s* Pounds payed down. Conſequently, when $n=42$ Half $=21$ Years, and $s=$ any Sum payed down, then $,038728675 \times s=$ the half yearly Penſion or yearly Rent on Leaſe (payable for the ſaid Term *n*) $=$ (when *s* paid down $=100$) to *l.* 3.8728675 $=$

	l.	*s.*	*d.*	*q.*	
	3	17	5	1.9528	
But the Half yearly Rent	12	0	0	0	when 24 Acres are hired, [*per* Queſt.
The Tenant ſhould pay, Diff.	8	2	6	2.0472	
But (by Queſt.) he pays only	7				
Tenant's ½ yearly Advantage	1	2	6	2.0472	

Hence, the more the Tenant pays down, or the more Acres he hires of the Landlord, the more will be his Gain.

Therefore he muſt hire 120, the greateſt Number of Acres: Say, if 24 Acres pay down 100 *l.* ſo 120 Acres will pay down 500 *l.*

		l.	*s.*	*d.*	*q.*
But ,038728675 × 500 = 19,3643375, ½ yearly Penſion payable by the Landlord to the Tenant	=	19	7	3	1,764
The half yearly Rent payable by the Tenant to the Landlord		60	0	0	0
Half yearly Rent the Tenant ſhould pay to the Landlord on a Ballance . .		40	12	8	2,236
But as 24 Acres pay 14 *l.* yearly Rent, ſo 120 Acres pay 70 *l.* and the half yearly Rent		35			
Half yearly Rent Gain to the Tenant		5	12	8	2,236

Now, by P. 211, *Jones*'s *Synopſis Palmariorum*, $a - \frac{a}{x^n} \div x - 1$, the *preſent Worth* of a half yearly Penſion, or Rent, on Leaſe, payable for n half Years, at x Amount of 1 *l.* and its Intereſt at 5 *per Cent. per Annum*, allowing compound Intereſt Diſcount. Or (when $n = 42$, and $x = 1.025$) 25.820654 × a = preſent Worth. Hence, the preſent *Worth* to the Landlord of 60 *l.* ½ yearly Rent, payable for 42 half Years . . = 1549.23924
Paid down to the Landlord by the Tenant 500

Remain due to the Landlord . . £. 1049.23924 preſent Worth. which ×d into the Factor ,038728675 = 40.63564552, &c. a ½ yearly Rent, as before, inſtead of 35 the Tenant's Agreement.

	Preſent Worth.
But 35 a ½ yearly Rent (or 35 × 25.820654) =	903.72289
Paid down . .	500.
Preſent Worth of the *Tenant*'s Money and Rent	1403.72289
Preſent Worth of the Landlord's original Rent	1549.23924
Preſent Worth of the *Tenant*'s Gain by this Bargain	145.51635 Dif.

And px^n = the whole Amount of that Gain, or Tenant's Gain, at the End of n, or 42 half Years at 5 *per Cent. per Annum*, compound Intereſt . . . . . . = 410.5021, or
410 *l.* 10 *s.* 5 *d.* 1 *q.* ,6 required.

But the *preſent Worth* of 5.6356625, the Farmer's half yearly Gain for 42 half Years = ,038728675 × 5.6356625 . . . = 145.5164
as before, W. W. R.

The

The PRIZE-QUESTION *anſwered by the Propoſer, Mr.* Edward Johnſon, *of* Hull.

If we put $x=\frac{3y}{4}$, and $y=\frac{3z}{4}$, it is evident that $x=\frac{9z}{16}$. Now write $\frac{3y}{4}$ for x in 1ſt Equat. and it becomes $\frac{9y^2}{16}+y^2=\frac{25y^2}{16}=\square$ *univerſally.*

Subſtitute $\frac{3z}{4}$ for y, in 2d Equat. and we get $\frac{25z^2}{16}=\square$, *univerſally.*

Now, writing $\frac{9z}{16}$ for x, and $\frac{3z}{4}$ for y, in 3d Equat. it becomes $\overline{\frac{9z}{16}+\frac{3z}{4}}\Big|^2+\overline{\frac{3z}{4}+z}\Big|^2=\square=n^2$; reduced $\frac{35z}{16}=n$. Therefore $z=\frac{16n}{35}$, a *whole* Number, *per* Queſtion.

$$\begin{array}{rl} \text{If } n = & 35,\ 70,\ 105,\ 140,\ \&c. \\ \text{Then} \left\{\begin{array}{l} x = \ \ 9,\ 18,\ 27,\ 36,\ \&c. \\ y = 12,\ 24,\ 36,\ 48,\ \&c. \\ z = 16,\ 32,\ 48,\ 64,\ \&c. \end{array}\right. \end{array}$$

The *firſt* Row of $x=9$, $y=12$, and $z=16$, being the *leaſt* whole Numbers anſwering the Queſtion.

W. W. R.

Cheſterfieldienſis alſo ſolved the *Prize-Queſtion* by a *different Method*, containing too much to inſert.

*** *The* 12 *Prize Palladiums, equal in Value to* 8 *of the* larger Size, *having no Competitors but* Cheſterfieldienſis *and Mr.* Johnſon, *of* Hull, *they fell by Lot to the latter of thoſe Gentlemen; who has deſervedly won the Prize.*

REMARKS *and* CORRECTIONS.

V. QUESTION 207, *anſwered by Mr.* Edward Johnſon, *of* Hull.

See P. 35, *backwards.*

Fig. I.

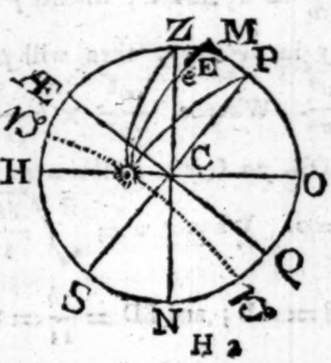
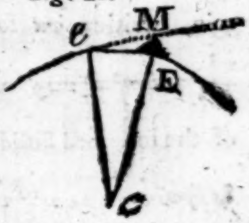


Fig. II.



LET Z preſent the Town, and M the Mountain, then by the Queſtion, in the Triangle Z⊙P, the three Sides are given, *viz.* Z⊙ = 90°, ZP = 36° the

Comp. of Latitude, and $P\odot = 90^\circ + 23^\circ\ 29' = 113^\circ\ 29'$; from whence, by Trigonometry, the Angle $ZP\odot$ is found $= 53^\circ\ 16'\ 26''$. Now draw the Arch of a great Circle from $\odot$ to (E) the Place in Latitude 64° N. and then in the Triangle $\odot EP$, we have $EP = 26^\circ$ the Comp. Lat. of the Mountain, $P\odot = 113^\circ\ 29'$ and $\angle EP\odot = 53^\circ\ 16'\ 26''$, found above, to find $E\odot = 96^\circ\ 45'\ 38''$; from which take 90°, and the Remainder is $6^\circ\ 45'\ 38'' = Ee$, and a Spectator at *e* would ſee the Sun in the Horizon at the ſame Time as if he was placed at Z. But at E the Sun would not be viſible, unleſs the Spectator be elevated above the Horizon of that Place; therefore to know how much this Elevation muſt be, or, which is the ſame, to find the Height of the Mountain, imagine a Tangent to be drawn from *e*, and another Line drawn from C, the Earth's Center, to meet the Tangent in M, then EM will repreſent the Mountain's Height. —— In the Triangle CeM, (*Fig. 2.*) we have $Ce = 3985$ Miles, the Earth's Semi-diameter, and $\angle C = 6^\circ\ 45'\ 38''$, whoſe natural Secant is $= 1.00070017$, which drawn into 3985 gives 4012.90177 Miles, $= CM$, from which $CE = 3985$ being taken, leaves 27.90177, the Height of the Mountain. W. W. R.

The Sun muſt be ſeen at the ſame Time at M, as at *e*; becauſe he may be obſerved in the ſame Tangent Line, at both Places.

Anſwer to XIV. QUESTION, *by Mr.* Paul Sharp, *of* Biddenden, *in* Kent.

HE making the Curves convex *inſtead of concave* towards the *Axis*, puts CA for the Half the Curve whoſe Equation is $px^4 = y^3$, and FDB (*ſee Fig. P. 44*) that whoſe Equation is $px^3 = y$; whoſe Rotation about the *Axis* AD will generate the Solids required. The former Curve (by the Writers on Fluxions) is $= \frac{3}{11}$, and the latter $\frac{1}{7}$ of their circumſcribing Cylinders. Therefore, putting $a = 26065$, $b = 30$, and $c = 3.1416$, &c. we have $\frac{3cby^2}{11} = a$, *per* Queſt. $\because y = \sqrt{\frac{11a}{3cb}} = 25 = DC$; whence $p = ,01929$. Again, writing vx for y in $px^4 = y^3$, then will $px = v^3$, $\because x = \frac{v^3}{p}$, and $v^2x^2 = y^2 = \frac{v^8}{p^2}$. Whence, $\frac{cv^8}{7p^2} \times b - \frac{v^3}{p} =$ Solidity of the inſcribed Solid FDB, *per* Queſt. a Maximum whoſe Fluxion is $8cbpv^7\dot{v} - 11v^{10}\dot{v} = 0$: Whence $v = \sqrt[3]{\frac{8bp}{11}} = 0.749405$, $\because x = \frac{8b}{11} = 21.81818 = AE$; and $ED = \frac{3b}{11} = 8.18182 =$ Axis of the inſcribed Solid, and $vx = y = 22.48215 = EB = EF$, the Radius of the Baſe. —— Whence the Solidity $= 1855.99978$ or 1856 inſtead of 981.696094, according to Mr. *John Thompſon.*

Corollary. *Hence the* Axis *of the inſcribed Solid is equal to* $\frac{3}{11}$ *of the circumſcribing Solid.*

Farther EXAMINATION *of Mr.* G. BROWN's [*marked* Rubes's] *Solution at P.* 64, Palladium 1759, *to his Queſtion* 140, Palladium 1758.

WHO aſſumes this *Motto, Arithmeticæ ſpecioſè peritus*; without adding *Pharmacopola circumferaneus, Opiferque per Orbem, dicor.*

As Radius : Coſ. Courſe (had from *B*'s intricate and uſeleſs Equations by *Trial* and *Error*, inſtead of firſt uſing *Trial* and *Error* by eaſy Rules of Proportion, *Caſe* 6, *P.* 305, *Royal Aſtronomer and Na-*

Miles or *Min.* *Min.* *D. Lat.* *Lat. arr. in*

vigator) :: Diſt. run 2729.745 (60 to Deg.) : 1055 = 17° 45′ | 32° 10 | folg.
Correſp. to *Min.* 2356.62 ($69\frac{1}{2}$ to Deg.) 910.79 = 15 11 | 34 44 |

Min. *D. Lon.*

Now, as Rad. : Merid. Dif. Lat. 1427 | :: Tan. Courſe | : 3405 = 56° 45
1242 | 67° 15′ 51″ | : 2964 = 49 24

Given Long.		*Error.*	
56° 16′ W.	or	0° 29′	*much.*
303 44 E.		6 52	*little.*

☞ Hence, the *Courſe* he has erroneouſly found from the *intricate* and *uſeleſs Equations*, cannot agree with the given Longitude by Mr. *Brown*'s fruitleſs Attempt now to change the *Data*, to make a *nearer* Agreement; though at the *farther* Expence of Truth, in his Letter, dated *New-Rope-Walk, Portſmouth-Common, Auguſt* 24, 1762, falſifying the *Queſtion* propoſed as he firſt ſent us, and we propoſed.

Mr. BROWN's REMARKS *on Mr.* SIMPSON's ERRORS.

HE obſerves that Mr. *Simpſon*, at P. 289, *laſt Edition* of his Fluxions, finds the Fluent of $\frac{\dot{x}}{x} + \frac{\dot{y}}{y} = \frac{x^m \dot{x}}{ay^n}$ to be $= yx = \frac{x^{m+2}}{a \times \overline{m+2}}$, *i. e.* the Fluent in a particular Caſe, when $n = 1$. He farther obſerves, that *Simpſon*, at P. 290, he finds the Fluent of $\frac{p\dot{x}}{x} + \frac{r\dot{y}}{y} = \frac{x^m \dot{x}}{ay^n}$, to be $x^p\ y^r = \frac{x^{m+p+1}}{a \times \overline{m+p+1}}$, *i. e.* the *Fluent* in one particular Caſe, when $n = r$; both which Determinations, *he thinks*, are not much to Mr. *Simpſon*'s Credit.

Mr. *Brown* propoſed (he ſays) at P. 268, *London Magazine*, for *May* 1762, this

QUESTION. *In the Equation* $\frac{b\dot{x}}{x} \pm \frac{c\dot{y}}{y} = \frac{x^m \dot{x}}{ay^n}$, *it is required to determine the Relation of the* Fluents x and y, *when* $x = y = a$? —— The Fluents of which Mr. *Brown* has found in general Terms; (the Fluxions being particular Caſes) *viz.* the *Fluent* of the former $= \overline{yx}|^n = \frac{nx^{m+n+1}}{a \times \overline{m+n+1}}$; and of the *latter*

$$x^{\frac{pn}{r}} = \frac{nx^{m+\frac{pn}{r}+1}}{a \times \overline{m+\frac{pn}{r}+1}},$$

ſuppoſing (he ſays) there be no *Correction* neceſſary.

He next obſerves, that Qu. 302, *Lad. Diary* 1762, is a *particular* Caſe alſo; and that thoſe Perſons who anſwered Qu. 488, P. 46. *Lad. Diary* 1762, (as conducted by Mr. *Simpſon*) are miſtaken in finding the Curve's Area; *viz.* particularly Mr. *W. Spencer*, who makes the Area itſelf $= \frac{3y^2}{4}$ (when $x = y$) the Area found by Mr. *Brown* being $\frac{3y^2 - 1}{4}$ (when $x = y$) $= 5.291788$; who refers to Queſtion and Anſwer, P. 79, *Royal Magazine*, for *Auguſt* 1761; and objects to the Area given by Mr. P. M. of *Durham*, in that Caſe, $= 5.61831$, which ſhould be 5.291788, as before. —— That Solution, at P. 40, *Ladies Diary*, 1761, is *wrong*, becauſe, at L. 3, from the Top, the Subſtitution is without Foundation. —— Whence, he infers, that what follows is *entirely an Error*. Who wonders that the *Ladies Diary* Author ſhould publiſh ſuch a *truncated* Solution.

He alſo ſays, that Mr. *Harriſ*[illegible]'s Solution to Queſtion 201. P. 49, *Palladium* 1762, is falſe; becauſe the Method on which that Solution is founded is *wholly ſo*; that therefore the Concluſion is ſo, *ut Opinio ſua fert*. [Quere whether Mr. *Harriſ*[illegible] will mend his Solution, or Mr. *Brown* his Judgment?]

That *Queſtion* 228 by Mr. *Edward Johnſon*, P. 16, *Palladium* 1762, is in *Martin*'s *Magazine* for *April* 1759, to be ſolved by a *Quadratic*; and afterwards in *Scotius*'s dying *monthly Collection*, propoſed to be ſolved by a *ſimple Equation*, which were done — *as ſome Men borrow the Cloaths they wear*.

Who takes great Notice of the *Bagpiping* of the *Pater-noſter Malcontents*; *the Horns of the muckle De'el, &c. au what a Mon is this*, quoth *Sawney*, *wha bites me leik a Louſe the Beggar!*

To

To the PALLADIUM-AUTHOR.

Sir,

THE *Fluents* found by *Simpſon*, which *Brown* mentions, are rightly found for theſe *particular Caſes*; and if *Brown* has found them in *general*, he has ſo far improved upon *Simpſon*. The former he mentions will hold good; but the *latter* I cannot make out. For $x^u y^{\frac{pu}{r}} =$

$$\frac{u x^{m+\frac{pu}{r}+1}}{a \times m \times \frac{pu}{r}+1},$$ put into *Fluxions* produces $\frac{r\dot{x}}{x}+\frac{p\dot{y}}{y}=$

$$\frac{r x^{m+\frac{pu}{r}-u}}{a y^{\frac{pu}{r}}},$$ which ſhould be $\frac{p\dot{x}}{x}+\frac{r\dot{y}}{y}=\frac{x^m \dot{x}}{a y^n}$.

In *Queſt.* 488, *Brown* finds the *Area* true, which is $\frac{3yy-1}{4}$. The Reaſon is, becauſe the Others had not corrected the *Fluent*.

As to the 13th *Query*, (*Palladium* 1762) — when a *given Quantity* is either *added* or *ſubtracted*, the *Sum* or *Difference* will ſtill be a *Maximum* or *Minimum*.

But the old Queſtion of *Brown*'s (Queſt. 140, *Palladium* 1758) muſt be *wrong*, as was ſhewn long ſince; and if he *perſiſts in the Truth of his Solution, he ought to produce his Calculation as well as his Theorem to make it out.*

I am, Sir, your's, &c.

NEWTONIENSIS.

OVERSIGHTS *in* PALLADIUM 1762 *corrected*.

P. 72, L. 11. for Lat. 57° 53′, r. 51° 53′ N. Same P. L. 18. for Lat. 33° 9′, r. Lat. 38° 9′.

P. 77, L. 12. for 61° 15′ 51″, r. 57° 15′ 51″. L. 17. for 303° 41′ E. r. 303° 44′ E. P. 79, L. 10. from Bot. laſt Column, for 52.2, r. 52.1. P. 80. Epact 4, not 14, Cycle of the Sun 7, not 8. *N. B. De la Caille* has the Sun's Cycle too much by 1, in his *Ephemerides* from 1755 to 1765, ſo liable are even the Great to

Error. P. 47, L. 15. for $5^h\,22^m$, r. $5^h\,32^m$, ſemid. Arc. and for $5^h\,12^m$, r. $5^h\,22^m$, ☽ ſets. Same P. L. 3. from Bot. for 6×400 … 2401, r. $1, + 6 \times 400$; for 7×400, r. $1, + 7 \times 400 = 2801$. P. 4, L. 7. from Bot. for $1 + 3$ t. 700, r. $1, + 3 \times 700 = 2101$. P. 58, L. 21. r. *Kepler* 3500.

N. B. *P.* 3, L. 28. *for* CB, ED, GF, *in the* 3 *Columns againſt* 1, *above whole Hundreds before Chriſt, not diviſible by* 4, *take only the firſt Letters* C, E, G, *reſpectively; being the only* Exception *in the whole Table, which Table could not be made uſeful otherwiſe.*

OBSERVATIONS.

Queſt. 89, *Pall.* Mr. *Brown* objects to as *Plagiary*, being ſimilar to Mr. *Jones*'s Queſtion at P. 12, *Gardiner*'s fol. Logs. propoſed in *Pall.* for a new Method of Solution. — Which *Queſtion* Mr. *B.* ſays is in *Muller*'s *Elem. Math.* P. 417, Vol. II. which we never conſulted (*any more than from whence he took his Queſtions ſent us, Emerſon*'s *Fluxions*, *Simpſon*'s *Analytics, &c.*) Who ſays, that his [intricate] Equations agree, in their Solution, with *Jones*'s Equations in *Sherwin*'s *Tables*, though not there; but in *Gardiner*'s Tables; enlarging and correcting *Sherwin*'s. — But if Mr. *B.*'s Equations were *true*, they are too *intricate* for Practice, and far *leſs* uſeful than Mr. *Rowe*'s *Method of Solution at P.* 45, Pall. 1761, *or than Rules at P.* 305, Royal Aſtronomer and Navigator.

The *lunar Equations* by *Ferguſon*, in his *Aſtronomy*, are entirely falſe, and conſtructed on falſe Principles, whether the late Dr. *Bradley* examined the like in an Eclipſe MS, or not, by the ſame *Author*. — *Who never could anſwer this Objection.*

Mr. *Brown* ſays, that the 6th Queſtion, by himſelf, P. 26. *Pall.* 1758, (*the Anſwer being untrue, as are thoſe at P.* 80, *Pall.* 1760, *and P.* 45, *P.* 1761) was a Sort of Queſtion propoſed by Dr. *Halley*, in *Philoſ. Tranſ. abridged*, but not anſwered; who (he ſays) ſpeaks in Commendation of theſe Queſtions.

WE recommend the *ingenious* Mr. THOMAS MARSHALL, of *Blenchland*, for his Abilities in Teaching all the Branches of the Mathematics; as we approve his conciſe Methods of Solution to the Queſtions propoſed in our *Palladium*. —— He ſolved the 26th Queſtion by theſe Theorems, $x = \sqrt{\frac{3a^2 - b}{8a}} + \sqrt{\frac{3b - a^2}{8a}}$, $y = \sqrt{\frac{3a^2 - b}{8a}} - \sqrt{\frac{3b - a^2}{8a}}$, x being the greater.

THIS Correſpondent *obſerves* that the *Palladiums* cannot but with Difficulty be got from the *Country Bookſellers*. That when he has ſent for a Number to one of thoſe Gentlemen for the Uſe of his Pupils, he has been afterwards requeſted to return great Part thereof to oblige other of the Bookſeller's Cuſtomers, rather than the Bookſeller would be at the Trouble and Hazard to ſend for more *Palladiums* to *London*. — By which Reſtraints among the Trade, the *Palladium* has met with many and great Diſcouragements. — But as a Remedy for the ſame, Mr. *Marſhall* has ſet an Example to other Teachers to ſend to Mr. *Fuller* the Publiſher for a ſufficient Number of the *Palladiums* in Time, at Bookſeller's Price, for ſupplying thoſe deſirous of Improvement in mathematical Knowledge.

SUPERNUMERARY QUESTIONS.

XXX. QUESTION 261. *By Mr.* Paul Sharp, *of* Biddenden, Kent.

$$\left.\begin{aligned}\frac{x^3+y^3}{y^2x}&=2.3625.\\ \frac{xy}{y^2-x}&=1.29032\end{aligned}\right\}$$

Required two Perſons Ages, denoted by x and y Years?

XXXI. QUESTION 262. *By the Same.*

THE Time of emptying a Veſſel in Form of a common parabolic Conoid when filled with Water, through a Hole in the Baſe, is double the Time it takes in emptying, when inverted, through an equal *Orifice*: Required the Demonſtration.

XXXII. QUESTION 263. *By the Same.*

TO find 3 Numbers in arithmetical Progreſſion, that the Sum of every two of thoſe Numbers ſhall be a Square.

XXXIII. QUESTION 264. *By* Chronologicus.

REQUIRED the Years current, *before* and *ſince Chriſt*, when the *Moon*'s Cycle was, and will be, 9, the *Indiction* 9, Dom. Letter for O. Style, F, for N. Style D.

XXXIV. QUESTION 265. *By the* Author.

IN what Years, *before* and *ſince Chriſt*, was and will be, the Dom. Letters *Julian Style* FE, *Gregorian* Style, for the Year before *Chriſt*, DC, for the Year ſince *Chriſt*, AG, and the Sun and Moon's Cycles and *Roman* Indiction all alike? And what the Number of each of thoſe Cycles was and will be?

XXXV. QUESTION 266. *By* Juvenis.

IN what Time will an Annuity of 10 *l.* a Year pay off a *Bond-Debt* of 100 *l.* allowing *compound Intereſt*, at 5 *per* Cent, for the Money borrowed and paid?

☞ *See the* Royal Aſtronomer and Navigator *for a* Method *of anſwering the above* chronological *Queſtions, or any other, correctly.*

ew TABLE, ſhewing the N°. of the Sun's *Cycle*, at Sight, for any Yr. bef. or ſin. *Chr.*

YEARS above CENTURIES *ſince* CHRIST.				CENTURIES ſince *Chriſt.*							YEARS above CENTURIES *before* CHRIST.			
				3500 2800 2100 1400 700 0	3600 2900 2200 1500 800 100	3700 3000 2300 1600 900 200	3800 3100 2400 1700 1000 300	3900 3200 2500 1800 1100 400	4000 3300 2600 1900 1200 500	4100 3400 2700 2000 1300 600				
				N°.9	25	13	1	17	5	21				
1	29	57	85	10	26	14	2	18	6	22	16	44	72	100
2	30	58	86	11	27	15	3	19	7	23	15	43	71	99
3	31	59	87	12	28	16	4	20	8	24	14	42	70	98
4	32	60	88	13	1	17	5	21	9	25	13	41	69	97
5	33	61	89	14	2	18	6	22	10	26	12	40	68	96
6	34	62	90	15	3	19	7	23	11	27	11	39	67	95
7	35	63	91	16	4	20	8	24	12	28	10	38	66	94
8	36	64	92	17	5	21	9	25	13	1	9	37	65	93
9	37	65	93	18	6	22	10	26	14	2	8	36	64	92
10	38	66	94	19	7	23	11	27	15	3	7	35	63	91
11	39	67	95	20	8	24	12	28	16	4	6	34	62	90
12	40	68	96	21	9	25	13	1	17	5	5	33	61	89
13	41	69	97	22	10	26	14	2	18	6	4	32	60	88
14	42	70	98	23	11	27	15	3	19	7	3	31	59	87
15	43	71	99	24	12	28	16	4	20	8	2	30	58	86
16	44	72	100	25	13	1	17	5	21	9	1	29	57	85
17	45	73		26	14	2	18	6	22	10		28	56	84
18	46	74		27	15	3	19	7	23	11		27	55	83
19	47	75		28	16	4	20	8	24	12		26	54	82
20	48	76		1	17	5	21	9	25	13		25	53	81
21	49	77		2	18	6	22	10	26	14		24	52	80
22	50	78		3	19	7	23	11	27	15		23	51	79
23	51	79		4	20	8	24	12	28	16		22	50	78
24	52	80		5	21	9	25	13	1	17		21	49	77
25	53	81		6	22	10	26	14	2	18		20	48	76
26	54	82		7	23	11	27	15	3	19		19	47	75
27	55	83		8	24	12	28	16	4	20		18	46	74
28	56	84		9	25	13	1	17	5	21		17	45	73
				N.26	14	2	18	6	22	10				
				600 1300 2000 2700 3400	500 1200 1900 2600 3300	400 1100 1800 2500 3200	300 1000 1700 2400 3100	200 900 1600 2300 3000	100 800 1500 2200 2900	0 700 1400 2100 2800				
				CENTURIES before *Chriſt.*										

Ex. ſince Chr. Under 1700 & ag^{t} 63, ſince *Chr.* ſtands 8, the N°. of ☉'s Cyc. for 1763, ſince *Chriſt.*

Ex. before Chr. Above 1700 & ag^{t} 63, bef. *Chr.* ſtands 11, for N°. of ☉'s Cycle.

To find the Sund. Let. for O. and then for N. S. 1763, *ſin.* Chr.—Ag^{t} 8 ſtands E, *Sun.* Let. for O.S, E=5, to which add 11, Ds. Dif. Style, (for 1763 bef. *Chr.*) will be 16, divide by 7, & 2 rem. or B for *Sun. Let.* N.S.—Or add 4 (Dif. of 11, above 7) rejecg Sevens, rem. 2 or B, as bef.

Sun's Cycle and *Sunday* Letters.

1	GF	9	DC	17	AG	25	ED
2	E	10	B	18	F	26	C
3	D	11	A	19	E	27	B
4	C	12	G	20	D	28	A
5	BA	13	FE	21	CB	Old Style.	
6	G	14	D	22	A		
7	F	15	C	23	G		
8	E	16	B	24	F		

Add } Dif. } bef. 300 } ſin. } to
Sub. } Sty. } ſin. } *Cb.* } fr.
N°. Letter O. S. Divid. by 7, and the Remainder will be the N°. Letter, N. S.

CONSTRUCTION *of the foregoing* TABLE *of the* Sun's Cycle.

To find the Sun's Cycle ſince Chriſt.

RULE I. *Add* 9 to the Date *ſince Chriſt*, and divide the Sum by 28, and what remains is the Number of the Sun's Cycle for that Year.

To find the Sun's Cycle before Chriſt.

RULE II. *Subtract* 10 from the Date *before Chriſt*, divide the Difference by 28, what remains take from 28 for the Number of the Sun's Cycle that Year.

CHRONOLOGICAL RULES.

THE *Julian Epacts* depend on the Golden Numbers in counting ſo many Elevens (the Difference between the Days of the ſolar and lunar Year) rejecting the *Thirties*, the Days in a Moon's Age.

To determine the Julian *and then* Gregorian *Epacts for any Year before or ſince* Chriſt.

Firſt, find the Golden Number for the Year, by *Tab. P.* 5, *Palladium* 1762, then the *Julian Epacts* correſpondent will be as follow:

Golden Numbers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Julian Epacts	11	22	3	14	25	6	17	28	9	20	1	12	23	4	15	26	7	18	29

Required the Epacts 1763, ſince Chriſt, *for Old and New Style.*

By *Tab. P.* 5, *Pall.* 1762, the Gold. N°. for 1763, ſin. *Chr.* is 16
To which anſwers from the above Table . . 26 } *Jul. Ep.* O. S.
By *Pall.* 1763, P. 4, *Epact* retreat from O. to N. S. — 11 }
Rem. 15 *Greg. Ep.* N. S. [req^d.
Month-Day in the New more than in the Old Style + 11
Epact in the Old Style . . 26

Required the Epacts 1763, before Chriſt, for Old and New Style.

By *Tab. P.* 5, *Pall.* 1762, the Gold. N°. for 1763, bef. *Chr.* is 6
To which anſwers, from the above Table . . 6 } *Julian Epact.*
By *Pall.* 1763, *P.* 4, Epact's Advance from O. to N. S. + 4 } Ds. fr. 18 to [1700 b. *Ch.*
Gregorian Epact for 1763, N. S. . . 10 required.

But, by *ſame P. Table*, Epact's Reteat (contrary Sign to N. ☽ adv.) in O. S. . . . . . } —11 { Ds. from 18 to 1700 bef. *Ch.*

Take which from the *Julian* Epact, rem. 25 Epact O. S.
Or Month-Day in the new *leſs* than in O. S. — 15, from 10 the *Gregorian Epact*, rem. 25 (30 being added to 10) for the Epact, O. S. required.

A New TABLE ſhewing the Number of the ROMAN INDICTION-CYCLE, at Sight, for any Year before or ſince *Chriſt*.

In every 15 Hundred Years, the *Roman Indiction* revolves; being the ſame for Old or New Style.

Years above Hundreds before *Chriſt*.														
		99	98	97	96	95	94	93	92	91	90	89	88	87
86	85	84	83	82	81	80	79	78	77	76	75	74	73	72
71	70	69	68	67	66	65	64	63	62	61	60	59	58	57
56	55	54	53	52	51	50	49	48	47	46	45	44	43	42
41	40	39	38	37	36	35	34	33	32	31	30	29	28	27
26	25	24	23	22	21	20	19	18	17	16	15	14	13	12
11	10	9	8	7	6	5	4	3	2	1	0			

Years above Hundreds ſince *Chriſt*.														
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69	70	71	72	73	74
75	76	77	78	79	80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99					

Before *Chriſt*. Hundreds of Years.				Since *Chriſt*. Hundreds of Years.				Number of *Indiction* before and ſince *Chriſt*.														
59	44	29	14	0	15	30	45	3	4	5	6	7	8	9	10	11	12	13	14	15	1	2
58	43	28	13	1	16	31	46	13	14	15	1	2	3	4	5	6	7	8	9	10	11	12
57	42	27	12	2	17	32	47	8	9	10	11	12	13	13	15	1	2	3	4	5	6	7
56	41	26	11	3	18	33	48	3	4	5	6	7	8	9	10	11	12	13	14	15	1	2
55	40	25	10	4	19	34	49	13	14	15	1	2	3	4	5	6	7	8	9	10	11	12
54	39	24	9	5	20	35	50	8	9	10	11	12	13	14	15	1	2	3	4	5	6	7
53	38	23	8	6	21	36	51	3	4	5	6	7	8	9	10	11	12	13	14	15	1	2
52	37	22	7	7	22	37	52	13	14	15	1	2	3	4	5	6	7	8	9	10	11	12
51	36	21	6	8	23	38	53	8	9	10	11	12	13	14	15	1	2	3	4	5	6	7
50	35	20	5	9	24	39	54	3	4	5	6	7	8	9	10	11	12	13	14	15	1	2
49	34	19	4	10	25	40	55	13	14	15	1	2	3	4	5	6	7	8	9	10	11	12
48	33	18	3	11	26	41	56	8	9	10	11	12	13	14	15	1	2	3	4	5	6	7
47	32	17	2	12	27	42	57	3	4	5	6	7	8	9	10	11	12	13	14	15	1	2
46	31	16	1	13	28	43	58	13	14	15	1	2	3	4	5	6	7	8	9	10	11	12
45	30	15	0	14	29	44	59	8	9	10	11	12	13	14	15	1	2	3	4	5	6	7

Conſtruction. Add 3 to the Date current ſince *Chriſt*, and divide the Sum by 15, what remains is the Number of Indiction. — But ſubtract 4 from the Date before *Chriſt*, divide what remains by 15, and deduct what then remains from 15, for the Indiction, required.

To the PALLADIUM-AUTHOR.

Sir,

BY inſerting the following *Calculations*, or any Part of them, in the *Palladium* for 1763, you will much oblige your conſtant Reader, and already obliged,

humble Servant,
JOHN METCALFE.

Wentworth-Houſe, Yorkſhire,
April 26, 1762.

All computed by the ROYAL ASTRONOMER.

I. Solar Eclipſe, inviſible, on *Wedneſday* the 13th of *April*, in the *Forenoon*.

TABLE of the general PHÆNOMENA of the two *Solar* ECLIPSES, in 1763.

Morning, April 13, 1763, app. Time, at	*London.* h	m	s	*Latitude* S. °	′	″	*Longitude* W. °	′	″
The *Eclipſe* begins at Sun-riſe . . .	7	12	17	27	11	41	13	23	27
Sun riſes *centrally* eclipſed . .	8	19	22	27	11	8	30	9	42
The Eclipſe ends at Sun-riſe . . .	9	26	27	27	10	43	46	55	57
Eclipſe *central* under the equinoctial Colure	9	28	11	2	35	26	16	29	55 E
Ditto in the 90th Degree of the Ecliptic	10	16	43	9	1	47 N	25	49	15
Ditto under the *ſolſticial* Colure . .	12	4	40	28	47	4	67	22	40
Neareſt Approach to the North Pole	12	7	42	28	52	27	71	21	5
The *Eclipſe* begins at Sun-ſetting . .	11	6	59	27	9	58	107	56	3
Sun ſets *centrally* eclipſed . .	12	14	4	27	9	30	91	9	48
The *Eclipſe* ends at Sun-ſet *(Afternoon)* .	1	21	9	27	9	1	74	23	33

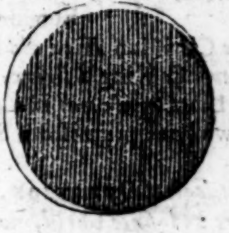
TABLE of the *Borealian* LIMIT of this ECLIPSE.

	h	m	s	°	′	″	°	′	″
Ingreſſion	8	40	25	7	13	49 N	41	15	34 W
Middle of the Tranſit over the Globe	10	16	43	39	0	32	5	56	4 E
In the Meridian	10	51	42	49	10	19	17	4	30
Egreſſion	11	53	1	61	4	38	108	27	36

COMPUTATION, and TYPE, for *St. Helena*, in the Southern, or *Ethiopic* Ocean.

April 13, 1763, Morning at *St. Helena*, Ap. Time.

	h	m
Beginning	7	0 ¾
Greateſt Obſcurity	8	18
End	9	49 ¾
Alt. Sun at Middle	29°	39′
Az. from E.	20	31
Digits eclipſed	10	46 ½



Type at the Middle.

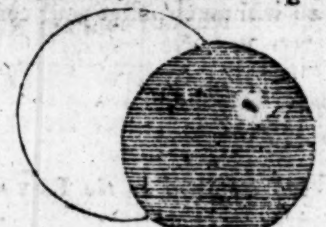
N. B. The Type for *St. Helena* is a little too much obſcured, for the *real* Quantity of the *Eclipſe*.

CALCULATION,

CALCULATION, and TYPE, for Fort *St. George*, on the Coaſt of *Coromandel*, in the *Eaſt Indies*.

April 13, 1763, Afternoon, Fort *St. George*.

	h	m	
Begins	4	19	½
Middle	5	30	
Sun ſets	6	9	
Amplitude of Sun	9	17	N
Central Angle	12	29	
Digits obſcured	6	9	



Type at Sun-ſet.

This Eclipſe will be very conſpicuous in the *Atlantic* Ocean, *Africa*, the *Levant*, *Euxine*, and *Caſpian* Seas, the South Parts of *Perſia*, *Arabia*, and *Mogul India*; and will be viſible to the greateſt Part of the *Mediterranean* Sea, *Italy*, *Turkey*, South Part of *Germany*, *Poland*, *Ruſſia*, and *Siberia*.

II. The *ſecond* Solar inviſible Eclipſe happens Part on the 6th and Part on the 7th Days of *October*.

October 6, 1763, Afternoon.

GENERAL TABLE.

	Time at *London*.			Latitude.				Longitude.			
	h	m	s	°	′	″		°	′	″	
Eclipſe begins at Sun-riſe . .	10	12	27	29	36	10	N	119	55	0	E
The Sun riſes *centrally* and totally eclipſed	11	7	53	30	14	24		106	8	14	
	Morning.										
7th, Eclipſe ends at Sun-riſe . ; .	12	3	21	32	20	56		92	32	22	
Central and total, in the Meridian . .	12	49	14	3	13	58	S	167	41	30	
Ditto in the *nonageſimal* Degrees . .	12	50	27	3	51	20		168	6	14	
Eclipſe begins at Sun-ſet . .	1	38	41	24	29	40		112	14	32	W
Sun ſets *centrally* and totally eclipſed .	2	34	9	26	36	17		125	52	3	
The *Eclipſe* ends, at Sun-ſetting .	3	29	35	27	14	23		139	39	5	

This Eclipſe will be total in *China*, the *Ladrones*, and in *many* Ports of the *Pacific* Ocean, and may be ſeen at *Japan*, *Formoſa*, *Borneo*, *Manilla*, and in *Chineſe Tartary*.

Of ASTRONOMY *and* CHRONOLOGY.

Aſtronomical QUESTION, *by Counſellor* River, *in* Bolt-Court, Fleet-ſtreet, London.

IN what Year of the Chriſtian Æra *did the Sun enter* Libra *exactly at* Noon, *to a Moment? In what* Engliſh King's *Reign, and in what Year of that Reign? And when will the* Sun *enter* Libra *again, at the ſame Hour and Moment, preciſely?*

To which Queſtion we have promiſed a Solution.

Chronological QUESTION. *By the* AUTHOR.

IN what Year, before and ſince Chriſt, was, and will be, the Sun's Cycle 1, *Moon's Cycle* 18, *and* Roman *Indiction* 5?

☞ See *Royal Aſtronomer*, P. 166, for a *general* Method of Solution.

Mr. *Rivet*, of *Bolt-Court, Fleet-ſtreet, London*, gave us for Anſwer the 1408th Year *before*, and 6572d Year *ſince Chriſt*. To the former of which Dates he gave GF for the *Dominical Letter*, making it a *Leap-Yr.*; but 1401, 1405, 1409, *&c.* are *Leap-Yrs.*; to which laſt GF anſwers, (and not to 1408, which has E for the *Julian* Dominical Letter, being the Year after Leap) as all the other *Conditions* of the Queſtion are found in the Year 1409 before *Chriſt*, and alſo in the 6572 Year ſince *Chriſt*. For, from the 1409 before, to the 6572 Year ſince *Chriſt*, is a *Julian* Period of 7980 Years completed; proved by the following *inverted Series before and ſince Chriſt, in ſucceſſive Order of Years.*

	Before Chr.					Since Chr.			
	4.	3.	2.	1.	. . .	1.	2.	3.	4.
Years between	—	1.	2.	3.	. . .	4.	5.	6.	7.
	7.	6.	5.	4.	. . .	3.	2.	1.	—

RULE 1. *The Sum of the Years before and ſince* Chriſt, *leſs* 1, *will be the Number of Years between.*

Example. From 4 before to 4 Years ſince *Chriſt*: will be 7 Years. For, $4 + 4 - 1 = 7$.

☞ *Mr.* Rivet *erroneouſly counted* 7980, *inſtead of* 7979 *Years from* 1408 *before, to* 6572 *ſince Chriſt.*

RULE 2. *Any Number of Years* ſince *Chriſt leſs* 1, *taken from the Years before and ſince Chriſt, will leave the Years before Chriſt.*

Example. From . . 7980 Years between, or a *Julian* Period.
Take 6572 ſin. *Ch.* — 1 = 6571

———

• Rem. 1409 Year *before Chriſt*, having the ſame *Sun, and Moon's Cycles, and Indiction, viz.* 1, 18, *and* 5, *reſpectively.*

RULE 3. *Any Number of Years before* Chriſt *leſs* 1, *taken from the Years between the Years before and ſince* Chriſt, *will leave the Years ſince* Chriſt.

Example. From . . 7980 Years between, or a *Jul.* Period.
Take 1409 bef. *Ch.* — 1 = 1408

———

Rem. 6572 Year ſince *Chriſt*, having the ſame *Sun*, and *Moon's Cycles*, and *Indiction*.

☞ *For Want of the foregoing Rules and Obſervations being made, not only Chronologiſts, but Aſtronomers, have been often miſled, or been bewildered in their Computations, for Years before and ſince* Chriſt, *to which the Year of the* Julian *Period, Year of the World, or any other* Æra, *only refers; as all true Computation depends on a* backward *or* forward *Series, from certain* Data *for any one Year before or ſince* Chriſt, *duly fixed. The* Cavils *about which Determinations have been endleſs, when the* Chronologiſt *is unwilling to be found in the wrong. Of which* Mr. Rivet *is a Witneſs.*

Chronological QUESTION, *by the* Author.

REQUIRED the Year current before Chriſt, *when the Dominical Letter,* New Style, *was* G, (for the *Gregorian* may be carried back like the *Julian* Style, before either exiſted) *the Sun's Cycle* 11, *and Moon's Cycle* 6?

IT may be obſerved, that the mean Places in *aſtronomical* Tables for the Years 1, 101, 201, 301, *&c.* are *miſrepreſented* by thoſe for 0, 100, 200, 300, *&c.* before *Chriſt*; of which Fallacy Mr. *Mayer*'s aſtronomical Tables are an Example, as well as others.

Mr. *Rivet* is pleaſed to recommend (for our Information and Conviction of aſtronomical and chronological *Error,* committed by Chronologiſts) a Book entitled, *A complete Syſtem of aſtronomical Chronology, unfolding the Scriptures,* (in which the Recommender has been himſelf an unwearied Labourer, we are told) *by* John Kennedy, *Rector of* Bradley, *in* Derbyſhire: Which Book we ſought for with an eager and curious Eye; and after fruitleſs Search, received the ſame from Mr. *John Millan, Bookſeller,* near *Charing-croſs,* no leſs known than eſteemed for his curious *Talents, Friendſhip,* and *Generoſity*; being printed for the Author, *John Kennedy,* 1752.

We find the ſame Book to be a *traditional* or hiſtorical *Chronology*; not built upon infallible *Data,* and the unerring Principles of *aſtronomical* or correct arithmetical Computation. For the Author, it is viſible to all Aſtronomers, has throughout his whole Book miſapplied the Word *Aſtronomical,* for what is merely *traditional* or *hiſtorical,* as in his Title we read, *A new Method of ſtating and explaining the Scripture-Chronology, upon* Moſaic *aſtronomical Principles, Mediums, and* Data, *as laid down in the* Pentateuch. —Not at all founded on *demonſtrative* Principles; but on hiſtorical and traditional Relations.

To evince which Aſſertions of ours, this *fallacious* Writer tells us, throughout the Courſe of his *wordy Work,* that MOSES (the Man who ordered the burning of the *Trinkets* and *Idols* of Gold, his wicked and idolatrous People had miſemployed in God's Service, giving them the *Aſhes* thereof for their Offences) was the *Father* and *Founder* of the only true *Philoſophy, Aſtronomy,* and *Chronology.* Which Writer (at *P.* 49. *of his Book)* entitles *Moſes* a ſkilful *Mathematician* and *expert Aſtronomer*; who, in other Pages of his fallacious Work, uſes unjuſt Reflections againſt every *ſuperior* Branch of true and demonſtrative Science; as *whimſical, perplexing,* or *irrational*; who might as well have diſgraced *mathematical Demonſtration* with the Name of *Superſtition,* or called *Euclid*'s Elements, or the *Newtonian Principia, Prieſtcraft Deluſion.*

He has ſet out, in his Book, with *an Error,* of fixing the *true* Quantities of the *ſolar* and *lunar* Years to certain and determinate *Data*; which, in the dark Ages of Antiquity and *Superſtition,* have been variable and uncertain, according to the different Corrections thoſe Years have undergone by Perſons of Authority, preſiding in the different Governments of thoſe Times. Who alſo builds his Concluſions on *traditional* Collections and fallacious Aſſertions. And beſides his making the *Sun* and *Moon* begin and end their Race through the

Ecliptic, at the Sign *Libra*, or *autumnal* Equinox, he objects to the *Exceſs* of Minutes and Seconds of Time above whole Days and Hours, as they are obſerved by the profeſſed Aſtronomers, in compleating their *periodical* Revolutions to that *autumnal* Point. Which *Exceſs* of Time he judges to be *fallacious (though determined from Obſervation)* and incompatible with the *true* Meaſures of the *ſolar* and *lunar* Year, ordained by the *divine Architect*, whoſe Works are *infinitely various*. He alſo objects to the different Lengths of the *ſolar* Years, as ſtated by Sir *Iſaac Newton*, and other eminent Aſtronomers; preferring his own *imaginary* Quantity of the ſolar Year, (not deduced from Obſervation) and his own Method of *fallacious* Computation. In the *Deduction* of which *different* Lengths of the ſolar Years, he appears to be a Stranger to the Nature of that Deduction; and that each *mean* ſolar Year is determined from the Time *elapſed* divided by the Number of Revolutions for that Time, more or leſs, and the ſame of the Revolutions. And unacquainted that the greater the Diſtance of Time and the greater the Number of Revolutions that are taken *(provided the Time and Number of Revolutions are pretty exact)* the more correct will be the *mean* ſolar Year, *(the true ſolar Year being continually variable.)*

Who ſeems to be a Stranger to the Difference between the *mean* and *true ſolar* Year; and unacquainted that the mean ſolar Year has of late been *deduced* from the *Time* elapſed, divided by the Number of Revolutions, ſince the Inſtruments for making Obſervation have received their greateſt Accuracy; which, in old Times were very *imperfect*, and not to be depended on. Nevertheleſs, a Diſtance of Time being taken as far back as the earlieſt Obſervations, will determine the mean ſolar Year to a ſufficient Nearneſs; ſince, if there ſhould be a large *Error* in the great Diſtance of Time, it will be divided into ſo many Parts by the great Number of Revolutions, as will make the Error in the Length of the mean Year become inſenſible.

Nor does this Author ſeem to know *(by his inconſiſtent Objections)* that the Quantities of the *mean* ſolar and lunar Year, and their correſpondent mean Motions and Places, are reduced to the true, by *ſolar and lunar Equation Tables*, fitted for that Purpoſe, from the Anomalies and other correſponding Arguments of thoſe Equations. Which is done to a great Exactneſs, ſince the Improvement in the Accuracy of *aſtronomical* Inſtruments, for making correct Obſervation.

He goes on (P. 67) to delude us, that the *Ptolomaic* muſt be the true one, if any Syſtem be ſo. — ‘ That the ſtupendous Circumvolution of the whole Heavens ſeems to be unwearied in the meaſuring of our Days, and to roll in Subſerviency to the Lord of this important Globe.’ — Who (P. 69) objects to and degrades all the modern *technical* Terms in Aſtronomy, as embarraſſing the Subject, and different from the *Moſaic* or antient Aſtronomy, as he denominates it, and prefers. His Words are,

‘ *As the antient and modern Aſtronomy are very different from each other in their* ‘ Calculus, (he might have ſaid, the modern true, and the antient falſe) *their* ‘ *Extent, and Terms, as widely different, as Philoſophy and no Philoſophy, as* ‘ *Art and no Art, as plain Simplicity and an oſtentatious Pomp and Parade of technical Language, it is quite neceſſary* (he ſays) *to begin with the* negative *Part of his* ‘ *Rule*’ [which is no Rule of Truth]. — Who recites, in Burleſque of modern Aſtronomy (as he thinks) a Train of the common and ſignificant Terms in Uſe, in the ſame Page, of whoſe Meaning and Uſe he appears to be wholly ignorant, while he deſpiſes their Uſe, in his Quotation of them; who cries up the *Moſaic* Calculation on all Occaſions, inſiſting that ‘ *Modern Science* (P. 73) *is but in its* ‘ *Dawn, and that we are but juſt recovering ſome Truths which were well known to*

‘ *Mankind (at firſt in general) above* 5000 *Years ago.* — *Take away* (ſays he) *the* Pentateuch *of* Moſes, *together with the aſtronomical Principles, Mediums, and Data, which are evidently, clearly, and perſpicuouſly* [if he is a Judge] *taught and inculcated there, for aught he can ſee, the ſacred and eccleſiaſtical lunar Year muſt be irretrievably loſt; and that too, in this aſtronomical Age. And yet* (ſays he) — haju lemognadim — *is a divine Law, enacted, in the Beginning*.’

‘ *Should it be enquired* (he ſays) *why the* Emperor *and* Pontifex Maximus *entirely diſcarded the lunar (which was the antient irregular* Roman) *Year, need we ſcruple to aſſign, for a Reaſon, the utter Inability of* Soſigines *(his Aſſiſtant and Director) to teach him how to accommodate, by true aſtronomical Laws, the one to the other, or the Moon's Year to the Sun's? And will any* European *Aſtronomer kindly ſtep in to ſupply this evident Want of Skill in the* Ægyptian? *Strange and unexpected Paradox!* (ſays he) *that, even in the Age of Science, we ſhould be obliged to return back to the remoteſt Ages of the antediluvian Patriarchs, and to their ſuperior Skill in Sun and Moon Aſtronomy,* (here his Judgment comes out) *and to learn from the Laws of primitive Science* (he might have ſaid primitive Error) *how to reſtore the coeval lunar Year, and how to rectify our* (preſent) *Miſapplications of the tropical ſolar to the* Julian (Year.)

P. 74. ‘ *Six primary Planets (ſay the modern Aſtronomers) move in elliptical Orbits about the Sun, the Center of their Motions. Why then* (ſays he) *it is as certain that there are ſix diſtinct Species of planetary Aſtronomy* (but not ſo many as there are Species of Faith.) *And is it not highly reaſonable, if not neceſſary, to be, firſt, well acquainted with our own,* (for Aſtronomy is in the Dawn with this Author) *before we are ſo impatient to gratify an uſeleſs Curioſity.*

‘ *The diurnal and annual Revolutions of* Jupiter, *for Inſtance,* (he ſays) *meaſures not* my Days, *nor my Years, nor do the Circumjovials preſide over my Nights.* — He proceeds —

‘ *After a general Account of the ſeveral Periods and Diſtances of theſe ſolid moving Orbs, together with their harmonious and truly divine proportional Law, (I mean that the Squares of their periodical Times are as the Cubes of their Diſtances)* [which he will not venture to contradict] *the Aſtronomer* [in his Judgment] *has not recorded a Phænomenon which can merit the Privilege of withdrawing our Contemplations and Studies from the* Moſaic *two great Luminaries. I except not the Altitude and Diameter of* Saturn's *Ring, whoſe immediate Uſe and Properties* [as far as he knows] *are beyond the Reach of Conjecture:* — *Nor the Immerſions aud Emerſions of the Satellites of* Jupiter, *a moſt enormous Planet,* [which he takes from the *true* Aſtronomers, as he does not know from *Moſes*] *and to us* (Cocab) *a Star of about the firſt Magnitude.*

‘ *Had we employed our chiefeſt Thoughts upon this one* Hebrew *Text,* (in which Language he centers all Knowledge) Gen. i. 16, Vaijagnaſh, Elohim eth Shenei hammeoroth haggedolim, [with which Fryar *Bacon* could raiſe *Old Nick*, to the Wonder of the Ignorant] *rather than in racking our Brains, if happily we might be able to calculate and determine the Diameter and Circumference of the extreme Orbit of* Saturn, (P. 75) *or ſolve (by geometrical Schemes) the ſeeming Retrogradations of* Mars, *we had long ago attained to that Perfection in Sun and Moon Aſtronomy, which the Creator intended* [knowing his Will] *to be the Object of our Knowledge, and of which he has qualified us to receive the Inſtruction.*

‘ *Then* (he ſaith) *I appeal to the greateſt Proficients in ſyſtematical Science, whether the civil and the ſacred Uſes, and the* final Cauſes *of periodic Motion, are not more affecting, more beneficial, and concerning Speculation, than precarious phyſical Ratio, and phyſical Law?* — (though drawn from Obſervation.)

‘ *The broad ſpheroidal Figure of the Earth is owing, ſays Sir* Iſaac Newton, *to the Earth's Rotation about its Axis*; *but ſurely, one would rather conclude, that its Form and Motion were both impreſſed by the Creator of it,* [as if he left Nothing to vary] *and, when impreſſed, could not be ſubject to any Mutability or Changes* [no, nor the Sea to advance and retreat at different Shores, nor magnetic Variation, *&c.*] *without the divine Interpoſition.*’ — Who has no Notion of the *Variation*, and *regular* Advance of the Places of the Conſtellations in the Ecliptic by the obſerved *Preceſſion of the Equinox*, (a Wonder to this *Moſaic* Author) by which Means Sir I. *Newton judiciouſly* aſcertained ſeveral *chronological* Dates, the *Moſaic* Computation could not.

‘ *Aſtronomy, as the Creator himſelf has revealed it to us, in his written Word, is uſeful, ſelf-concerning, plain, eaſy, and obvious to, common Apprehenſion,* [or does he, like ſome of his Brother Preachers, ſpeak for the Creator?] *while the learned Profeſſors have rendered it perplexed, intricate, and inacceſſible, to the Bulk of Mankind, (i. e.* of the prepoſſeſſed and ignorant) *as if they affected, like the old* Ægyptian *Prieſts, to become ſacred and venerable to the Vulgar by their* eſoteric Dogmata, *and their* hieroglyphic Grammata.’ — He goes on:

‘ *Arts and Sciences* [according to his Judgment] *have led us round-about Ways, nay, Thouſands and Millions of Miles out of the Way*; *into Paths, which God* [for he pretends to know his Will] *requires us not to traverſe*; *into remote and diſtant Regions, which we never deſigned to reach or comprehend.*’ — But he now ſpeaks of himſelf and ſome of his leſs ingenious Brother Preachers.

P. 76. ‘ *We, the Sun and Moon Aſtronomers of this terraqueous Globe, are no more concerned with the* Britiſh *Catalogue of* 3000 *fixed Stars than with the Parabola of a Comet.*

‘ *What Account the* (ſuppoſed) *Inhabitants of ſuperior and inferior Orbs might be able to give of Time and its Meaſures, were it within our Reach to examine them, I do not* (ſaith *John Kennedy) know, nor can a* Newton *inform my Ignorance. It is ſufficient for me, if I am able to render a ſatisfactory and true aſtronomical Account of my Days — and my Years — from the* Pentateuch *of* Moſes, *whoſe aſtronomical Directory is expreſſed in the* Hebrew Text, Gen. i. 14, *by a leſs Number of Words than there are primary Planets.* — Haju lejamin veſhanim.’ — [Quere whether the Doctor does not conjure and cant here at the ſame Time?]

Enough, the Goddeſs cries — enough I've ſeen!
How wide the Diff'rence is 'twixt Men and Men!

Thus we have given our Reader a *traditional*, for an *aſtronomical*, *Meſs*, by which he may judge of the Goodneſs of the *Cook*, or Mr. *John Kennedy*'s Judgement, in cooking *true Aſtronomy*; who with much Labour, Pains, and Induſtry, has endeavoured, in 431 Pages of Abſurdity, to ſet off *Ignorance* in Science for *Truth* and *Demonſtration*; to the great Amazement and Satisfaction of a Number of the *ſuperſtitious*, *illiterate*, and *believing Part* of Mankind; who take Things by *ipſe dixit*, or *implicit* Authority, without enquiring into their Foundation, Connection, and real Dependance.

While the triumphant Impoſer of *Abſurdity* for Truth (at P. 424) tells us, that ‘ *Purſuits after aſtronomical Improvements have been for ſome Time neglected, checked, and, I may ſay, had almoſt ſaid,* (mark his Reaſoning) *entirely ſuperſeded by the ſole Influence and Authority of Sir* Iſaac Newton; *who was profeſſedly,* [nay and truly] *in ſcientific Speculations, ſo eminent a Genius, ſo profound an Adept, that* Moſes, *the Writer of the* Pentateuch, [by the Aſſiſtance of his Clerks] *can alone, upon Earth, be intitled to a Superiority, and challenge the right Hand of Pre-eminence* [in Error]. *And, methinks, I ſee the* Jewiſh *Legiſlator,* Iſh Elohim, *ſeated on his glorious Throne, and beaming* [Error and Ignorance in Aſtronomy] *from his ſhining Countenance the impreſſed Rays of Divinity,* '(which have Nothing to do with the Rays of Aſtronomy nor thoſe of Sir *Iſaac Newton) with this Motto over his Head* — Magna eſt Veritas et prævalebit.' —

Here *Superſtition* fondly eyed her Child;
In ſable Mantle wrapt him o'er, and ſmil'd!

This *Hebrewmatical, Hutchinſonian*, or *Romainian*, Aſtronomer, making the Salvation of Mankind to depend upon the Knowledge of the *Hebrew* Language, (in which all *Myſteries*, as well as Abſurdities, are contained) not being able to diſtinguiſh between the Length of the *mean* and *true* ſolar Year, objects to the making the Alteration of the Style, in 1752, for 11 Days, which (as he critically finds) are not quite completed, by a *Defect of ſome Minutes of Time*, ſince the Council of *Nice*, according to the Length of any mean ſolar Year; though in the Year of the Council of *Nice*, the vernal Equinox might be back of Noon. But he does not know (by what he objects) that the *Intent* of that Alteration was to keep the Seaſons, or Sun's Places, to the ſame Days of the Month, to a Day; and as it was nearer 11 than 10 Days, from old to new Style, when the Alteration wat made in 1752, and as the Sun's Places are ſince kept to the ſame Days of the Month, by our new Method of reckoning *civil* Time, his Objection here, as in all other Places, is vain and fruitleſs.

He objects to the aſtronomical *New* and *Quarter* Moons, computed for odd Hours, in the *Almanacs*; as thinking them derived from perplexed and erroneous Calculation; and that they ſhould happen, correctly, to equal Days at Noon, according to his *Hebraic*, and not *Greciſing* Accounts; which laſt he is for aboliſhing, to erect his Computation in the Place of Truth, built on Obſervation of the real Motions of the Heavens. Who being wedded to the *autumnal* Equinox of *Libra*, he makes all Aſtronomy, in his Way, to depend upon the Sun's Entrance therein. — He pretends alſo to deduce all *Chronologies* from the *Moſaic* Syſtem. But ſuch is the Jargon and Confuſion of his Definitions, that we defy any Man of true Science to make either *Reaſon*, *Senſe*, or *Connection*, of what he has advanced from the Beginning to the End of his firſt Book of *Moſaic Aſtronomy* and *Chronology*; concluding with theſe anti-aſtronomical *Queries*.

I. Quere. '1. *For what particular Ends and Purpoſes, with Reſpect to us the Inhabitants of the Earth, has the great Creator (all the Operations of whoſe Hands are directed by infinite Wiſdom, which is gloriouſly diſplayed in final Cauſes) ordained a ſolar tropical Year, to conſiſt of one fourth Part of a Day over and above* 365?

'2. *How much leſs than one fourth Part of a Day exactly?*

'3. *For what particular Ends and Purpoſes with Reſpect to us?*

II. Quere. '*By what ſettled and determinate Rules may the ſeparate Quadrant be annually computed as well as* annually *meaſured, and ſtill the Day,* in civil *Reckoning, ſhall ever have an immutable* Epoch?

III. Quere. '*By what Law of Computation may we avoid the* numeral *Denomination of a* 13*th Month in the* lunar *Year, which the* Jews *call* Embolimæan, *and in the altered Year,* Ve-Adat?

IV. Quere. '*Should it be alledged that in the lunar Computation* I *have not obſerved the* Exactneſs *of Minutes and Seconds, I would, in my Anſwer, propoſe it as a nice and juſt Matter of Enquiry,*

'*Whether the Author of the* Syſtem *did not originally intend the* Cardinal *Points of the Day for the perfect Terminations of the aſtronomical* Calculus, *which an Adherence to Minutes and Seconds can never attain to?*

‘ *Should any one be deſirous to know by what Authority, and by the Direction of*
‘ *what Law, I have placed two ſeparate and two interſecting Circles, in the Front*
‘ *of the* patriarchal *Table*; *my Anſwer, in general, is this:*
‘ *I was directed to this* Scheme, *by contemplating the Circumſtances, Characters,*
‘ *and appendent Proportions, of the* created Poſition *of the* Moon *and* Sun; *and to*
‘ *evince the Reality of this, and its true Foundation in the primary Conſtitution of Na-*
‘ *ture, I here* [*i. e.* whimſimatically] *lay before the Reader a Table,* [of ſixteen
‘ Lines deep only,] *wherein is expreſſed, with integral Exactneſs, the whole Va-*
‘ *riety of Epacts, both full Moon and new Moon, which come immediately before the*
‘ *Equinox, through the Succeſſion of Ages,*’ [which we defy the wiſeſt Aſtronomer
in *Europe* to comprehend.] Who finally concludes, ‘ *that whilſt our Aſtronomers*
‘ *continue to calculate Conjunctions, Dichotomies, and Oppoſitions, they never will be*
‘ *able to diſcern thoſe (Moſaic) Diviſions* (of his) *of the Thirty-Day-Month*;
‘ *much leſs will they be able to aſcertain theſe proportional Variations of the* primitive
‘ *full Moons, and new Moons, from their created Centers, and returns to them in de-*
‘ *terminate Times.*’

⁂ Thus much we thought proper to ſay of Mr. *Rivet*'s favourite Author, who aſſerted he had ſhewn that *all Aſtronomers* and *Chronologers* were wrong, or defective, in their Calculations — though we have found *J. Kennedy*, his *Followers* and *Advocates*, *Romaine*, *Hutchinſon*, *&c.* to be alike qualified in *true Aſtronomy*, *Science*, and *Calculation*; as may be clearly evinced to all Judges and Lovers of Truth.

Quere, by Mr. *Rivet*, of *Bolt-Court.*

BY the Table (ſee Royal Aſtronomer, *P.* 146 *and* 148) *of remarkable Æras, the 1ſt Year of the World is ſaid to be the* 764*th Year of the* Julian *Period,* [anſwering to the 3950 current before *Chriſt*] *in which Year of the Period the ſolar Cycle was* 8, *and the Dominical Letter for that Year was* E.

And, by the Chronological Table, *in the next Page but one, the Dominical Letter* Anno Mundi primo *was* B. —[Yes for the 3949 ſince *Chriſt*, in 2d Table.]

How to reconcile this Difference?

The Anſwer. The Difference is reconciled by Mr. *Rivet*'s Miſtake, or his Miſuſe of the ſaid true *chronological* Tables, at P. 148. Which Tables (and for P. 149) exceed any other Method for finding the *Dominical Letter* for any Year before or ſince *Chriſt*, either according to O. or N. Style, as it is done at Sight. In Mr. *Rivet*'s *Method*, which is an *Abridgment* of what is common, there is an *Operation* required to find the Number of the *Sun's Cycle*, (which is done at Sight in *Tab.* P. 66, *this Pall.*) but the Dominical Letter, for both Styles, is beſt found, at once, by *Tab.* P. 3 and 4, *Pal.* 1762, or by *Tables* in the *Royal Aſtronomer*.

☞ By *Tab.* P. 148, *Royal Aſtronomer*, the 764 Year of the *Julian* Period, anſwering to the 3950th Year current or 3949 complete before *Chriſt*, (ſee *Tab.* P. 347, *Royal Aſtronomer*) has E, for its Dominical Letter.——3949 Years before *Chriſt* current anſwers to the 765th Year current of the *Julian* Period; and in P. 148, *in 1ſt Table under* 3900 *and againſt* 48 (deducting 1 from 49) you find E is not the Dominical Letter for 3949 current before *Chriſt*, but DC; being *Biſſextile*, —— Hence Mr. *Rivet*'s *Miſtake*; who again by Miſtake took out B (as appears) for the Dominical Letter, 3949 ſince *Chriſt*, in the *ſecond* inſtead of DC, from the *firſt* Table, for 3949 Years before *Chriſt*.

For 1 *muſt always be added to any tabular for the real Date bef.* Chr. *by the Nature of Notation*; *becauſe* 100 *tabular Years before* Chriſt *denote* 101; 200, 201, &c. *as from* 100 *Years ſince we go back to* 1 *before* Chriſt *for* 100 *Years*; *and alſo from thence*

thence to 101, 201, 301, &c. *a Thing not obſerved till noticed in the* Royal Aſtronomer.

Mr. Rivet's **Abridgement** *of the common Method of finding the Dominical Letter, for Old Style, from the Number of the Sun's Cycle.*

Dominical Letters for Julian *or Old Style; being perpetual.*						
GF	BA	DC	FE	AG	CB	ED
e d c	*g f e*	*b a g*	*d c b*	*f e d*	*a g f*	*c b a*
1	5	9	13	17	21	25
DC	FE	AG	CB	ED	GF	BA
b a g	*d c b*	*f e d*	*a g f*	*c b a*	*e d c*	*g f e*
Dom. Letters for New Style, according to Mr. Rivet, *ſerving from* 1700 *to* 1800.						

Explanation. By the *Author.*

The Dominical Letters depend on the Number of the ſolar Cycle, which began with the *Julian Period* (the 4713th cur. bef. *Chr.*) in the firſt Year whereof the Number of the *Sun's Cycle* was 1, the *Jul.* Letters were GF, and Moon's Cycle 1.

The Numbers placed between the *Tables* denote the *Biſſextile* Years, and the ſingle Letters under the double ones, anſwer to the three common Years ſucceeding each *Leap-Year.*

The *upper Table* relates to the old Style, and is *perpetual.*

The *lower Table* is *peculiar* to the *new Style,* and is not perpetual, but muſt be varied (as to the Poſition of the Letters) in every Century.

Thus, in the 19th *Century* fin. *Chr.* the Letters AG, in the lower Table, which ſtand under 9, muſt be tranſpoſed and ſet under N°. 5, the Sun's Cycle for 1900, CB under N°. 9, ED under 13, GF under 17, BA under 21, DC under 25, and FE under 1, being the Sun's Cycles, to thoſe Dom. Letters, N. S. for the firſt 28 Years in that Century; and ſo to be varied for other *Centuries.*

Wherefore, if the Number of the *Cycle* be known the *Dominical Letters* will be ſeen in the perpetual Table for O. S. and peculiar Tab. for a given Century, N. S.

Example. *In the preſent Year* 1763, (being the *third* after Leap-Year) *the Cycle of the Sun is* 8: *By the Tables, Number* 5 *was the laſt Biſſextile, and the Letters correſponding thereto, were by the* Julian *Calendar* BA, *and by the* Gregorian FE. *Conſequently* E *is the Dominical Letter, according to Old,* and B, *according to New Style, for* 1763.

Of the Moon's *and* Jupiter's *Satellite Theories compared.*

THE Moon's Theory is, in general, more to be depended on than the *Satellite Theory* of *Jupiter,* for finding the Diſtance of *Meridians,* (ſuppoſing the Inſtruments for taking both Obſervations to be equally correct) becauſe moſt Tables of the *Satellite Eclipſes* differ 2 or 3 *Minutes* of Time, in general; which is more defective than the *lunar* Theory. And the *Satellite-Eclipſes* in Numb. V. *Math. Mag.* differ, in their apparent Times, from *De la Caille*'s *Satellite Eclipſes,* by about 2 Minutes of Time, at a *mean*; ſubducting $9^m\ 25^s$ from his Times for *Paris,* for the Times at *London.*

Of the apparent Curvature *of* Venus's Orbit, *as ſeen from the Earth's Surface.*

THE ſmall Portion of *Venus*'s Orbit, over the *Sun,* may be conſidered as a *right Line,* without ſenſible Error, ſuppoſing a *Spectator* at the Earth's Center.

But, to a Perſon placed at different Parts of the Earth's Surface, the Portion of *Venus*'s Path, or viſible Orbit, over the Sun's Diſk, will be different from one another, as the Repreſentation for *England*, *St. Helena*, *Bencoolen*, or *Fort St. George*, are all different, and quite *different* to what have been in general repreſented by *pretending Aſtronomers.*

The *Requiſites* for delineating the Type of a *lunar Eclipſe*, and alſo for delineating the *Tranſit* of *Venus*, both in a Curve, take up more Time than the *Calculation* of the Times of thoſe *Phænomena*; which it may be neceſſary to apprize Mr. *Ferguſon* of, who gave all his Repreſentations of the late *Tranſit* of *Venus* over the Sun's Diſk very erroneous, in his Quarto Tranſit-Pamphlet, while he pretended to correct Dr. *Halley*.

Of Mr. HARRISON'*s moſt improved* MOVEMENTS *for meaſuring equal* TIME, *and determining the* LONGITUDE *at* SEA.

SUPPOSING Mr. *Harriſon*'s *Clock Machine*, or large improved Watch, to meaſure Time as equally as he ſuppoſes or as can be wiſhed, ſo as to vary from giving the mean Time at the *Place departed from*, but a few Seconds in a Voyage, (*which is hardly poſſible to effect*) yet there ſtill remains the Difficulty of obtaining the *correct mean Time*, at the *Place of the Ship* or diſtant Meridian, ariſing from ſeveral *Cauſes*, (*ſuch as Clouds, Fog, Ship's Motion, Swelling Sea, &c.*) preventing a true Horizon, in taking the Altitudes of the celeſtial Bodies; by which the equal Time at the Place of Obſervation, will be found wide of Truth. An *Error* in which *Obſervation* may produce another, of not leſs than a Minute or two, (more or leſs) in the equal Time of Obſervation, (every Minute Error in Time obſerved, making 15 Miles Error of Longitude) ſo that till the *mean Time, at the Ship, or Place of Obſervation*, can be *correctly aſcertained*, by *accurate* Inſtruments, and more certain Methods than are at preſent in Practice for determining *Altitudes*, (on which the Knowledge of the mean Time *at the Ship*, or Place of Obſervation, depends) all that Mr. *Harriſon* has performed, or can perform, with his *Clock* and *Watch*, in *determining the Longitude*, will be but a Step towards it, and can only ſerve to amuſe the Commiſſioners for that Diſcovery. Whereas, when Mr. *Siſſon*, in the *Strand*, has compleated his PERPENDICULAR CHAIR for giving the *true Horizon*, and taking *correct Altitudes*, the LONGITUDE may then (and not before) be expected from *Obſervation*.

N. B. *If the Error of* Harriſon's *Clock or Watch in the Time at the Place of Departure, and the Error of Time at the Place of the Ship, be contrary, (the one too faſt and the other too ſlow) the Error in the Longitude will be ſtill augmented; as making the Difference of Time between the Place of Departure and that of Obſervation the greater by the Sum of both thoſe Errors.*

To the PALLADIUM-AUTHOR.

Sir,

Mr. *Ferguſon*, in his *Quarto Tranſit-Pamphlet*, (wherein he attempts to correct Dr. *Halley*'s Error) inſtead of uſing 57′ 20″, the proper mean *horizontal Parallax*, uſes 58′ 10″; and inſtead of uſing *Sine*, for determining the Diſtances of the Moon and Planets, from the Earth's *Center*, as he propoſed, and as ſhould be determined; uſes *Tangent*, in the Proportion, which determines their reſpective *Diſtances* from the Earth's *Surface* only. Likewiſe this *Pretender* to *aſtronomical* Computation, from an *Error* begot on his former Error, of the Moon's mean *horizontal Parallax*, 58′ 10″ inſtead of 57′ 20″, makes 59.96 inſtead of 59.096

(as that *Operation* gives) Semi-diameters of the Earth from her *Surface* to the Moon, and yet given by him for her Diſtance from the Earth's Center.

Mr. FERGUSON's ERRORS *corrected.*

Sem. Diam. ⊖.
As Tan. 58′ 10″ : 1 Sem. D. ⊖ :: Rad. : 59.09603 fr. her Surf. to ☽.
But 59.96 by *Ferguſon.*

.86397 Dif. by 4000 Miles =
(3455.88 Miles, his *Error.*
Again, As S. 58′ 10″ : 1 Sem. D. ⊖ :: Rad. : 59.10447 fr. her Center to ☽, ac-
(cording to *Ferguſon.*
S. 57′ 20″ : 1 Sem. D. :: Rad. : 59.96347 according to Truth.

Diff. . . .85900 by 4000 = 3436 Miles,
(*Error too little.*
As Tan. 57′ 20″ : 1 Sem. D. :: Rad. : 59.95514 fr. her Surf. to the ☽.
59.96347 fr. her Cent. to ☽, above.

.00833 by 4000 = 33.32
(Miles, *Error,* or too little, by Tangent.

QUERE. *From what is ſhewn above, whether any Perſon pretending to correct the* Errors *of others ſhould be offended at ſeeing his* own *Errors corrected?* Whether *owning Error corrected to Truth is not the laudable Means of Improvement? And whether a Correction of the very erroneous lunar Equation Tables, in* Ferguſon's *Aſtronomy, to Truth, would not be alſo laudable?*

I am, Sir, your humble Servant,
Oxford, May 20, 1762. Aſtronomicus.

To the PALLADIUM-AUTHOR.

On the Hypercritical MONTHLY REVIEWERS.

SIR,

OBSERVING ſome *terrible Remarks* on the ROYAL ASTRONOMER AND NAVIGATOR, in the *Monthly Reviews* (no *Matter* where nor when) by thoſe *hypercritical* Remarkers, who are *Engineers* to certain *Malcontents* noticed in your *Palladium* for 1762; but they not having *demonſtrated* their *exact* Judgment on the Subject againſt that USEFUL PERFORMANCE, containing many new and intereſting *Improvements* in *Aſtronomy, Chronology,* and *Navigation,* I thought it not *amiſs* to recite, on this Occaſion, what Dr. *Swift* remarks, in his Digreſſions concerning this *Sort* of *profound Critics,* who are the Terror of their Times.

He ſays, (P. 71. of his TALE OF A TUB, which, and his *Gulliver's Travels, Diſſertation on Madneſs, Battle with the Books, Hiſtory of* John Bull, &c. make a Contraſt with *Roderick Random, Peregrine Pickle, Hiſtory of England, &c.* by the ſame Author,) ‘ *They are a Race of Men who delight to nibble at the Superfluities and Excreſcencies of Books, which the Learned at length obſerving, took Warning of their own Accord, to lop the luxuriant, the rotten, the dead, the ſapleſs, and the overgrown, Branches from their Works.*’ — But now all this he ſhades under the following Allegory: — ‘ *That the* Nauplians[*] *in* Argia *learned the Art of pruning their Vines, by obſerving, that when an* Ass *had browſed upon one of*

[*] *Lib.* 4.

‘ *them, it thrived the better and bore fairer Fruit.*’ But that *Herodotus* holding the ſame *Hieroglyphic*, ſpeaks much plainer. — That he hath been ſo bold to tax the true Critics of Ignorance and Malice; telling us openly, that in the *Weſtern* Part of *Lybia, there were* ASSES *with* HORNS: Upon which Relation *Cteſias* * yet refines; mentioning the very ſame *Animal* about *India*; adding, ‘ *That whereas all other* ASSES *wanted a Gall; theſe horned Aſſes were ſo redundant in that Part, that their Fleſh was not eaten becauſe of its extreme Bitterneſs.*’ — Dr. *Swift* goes on farther to tell us — ‘ That the Reaſon why thoſe antient Writers, here mentioned, treated their Subject only by *Types* and Figures, was, becauſe they durſt not make open Attacks againſt a Party ſo potent and ſo terrible as the Critics of thoſe Ages were; whoſe very Voice was ſo dreadful, that a Legion of Authors would tremble and drop their Pens at the Sound. That *Herodotus* in another Place declares, *how a vaſt Army of* Scythians *was put to Flight in a panic Terror by the Braying of an* Ass.

‘ That from hence it is conjectured by certain *profound Philologers*, that the great Awe and Reverence paid to a *true Critic* by the Writers of *Britain*, have been derived to us from thoſe our *Scythian Anceſtors*, who had a Mind to publiſhing their Sentiments more freely, in deſcribing the *true Critics* of their ſeveral Ages, were forced to leave off the Uſe of the *Hieroglyphic*, as too nearly approaching the *Prototype*, and invented other Terms inſtead thereof, that were more cautious and myſtical. That *Diodorus* ſpeaking to the ſame Purpoſe ventures no farther than to ſay, that in the *Mountains of* Helicon *there grows a certain Weed, which bears a Flower of ſo damned a Scent as to poiſon thoſe who offer to ſmell it.* That *Lucretius* gives the ſame Relation.

‘ *Eſt etiam in magnis Heliconis montibus arbos,*
‘ * *Floris odore hominem tetro conſueta necare.*

* Lib. 4. Lib. 6.

‘ But *Cteſias*, whom he lately quoted, has been much bolder, who having been uſed with much *Impertinence* by the true *Critics* of his own Age, and therefore could not forbear to leave behind him, at leaſt, one deep Mark of his Vengeance, againſt the whole *Tribe*. Whoſe Meaning is ſo near the Surface, that Dr. *Swift* wonders how it poſſibly came to be overlooked by thoſe who deny the Antiquity of the *true Critics*. For pretending to deſcribe many ſtrange Animals about *India* he has theſe remarkable Words.

‘ *Among the Reſt, ſays the Author, there is a Serpent that wants* Teeth, *and conſequently cannot bite; but if its* Vomit (to which it is much addicted) *happens to fall upon any Thing, a certain Rottenneſs or Corruption enſues. That theſe* Serpents *are generally found among the Mountains where* Jewels *grew; that they frequently emit a* poiſonous Juice, *whereof whoever drinks, that Perſon*'s Brains *fly out of his Noſtrils.*

‘ That there was among the Antients a Sort of Critics, not diſtinguiſhed in *Specie* from the former, but in Growth or Degree; who ſeem to have been only the *Tyros* or junior *Scholars*; yet, becauſe of their *differing* Employments, they are frequently mentioned as a Sect by themſelves.

‘ That the *uſual Exerciſe* of theſe younger *Students*, was to attend conſtantly at *Theatres* and learn to ſpy out the *worſt Parts* of the Play, (as in the *Regicide*) whereof they were obliged carefully to take Note, and render a *rational* Account to their Tutors.

‘ Fleſhed at theſe ſmaller Sports, like young *Wolves*, they grew up in Time to be *nimble* and ſtrong enough for hunting down large *Game*. — That it hath been obſerved (ſays Dr. *Swift*) both among Antients and Moderns, that a *true Cri-*

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* See *Excerpta ex eo apud Photium.*

'tic hath one Quality in common with a *Whore* or an *Alderman*; never to change his *Title* or his *Nature*; that a *grey* Critic has been certainly a *green* one, the Perfections and Acquirements of his Age being only the improved Talents of his Youth; like *Hemp*, which ſome *Naturaliſts* inform us is bad for Suffocation if taken in the *Seed*. Dr. *Swift* eſteems the Invention, or at leaſt the Refinement of *Prologues*, to have been owing to theſe younger Proficients, of whom *Terence* makes frequent and honourable Mention under the Name of *Malevoli*.

' Now, it is certain, ſays Dr. *Swift*, the Inſtitution of the *true Critics* was of abſolute Neceſſity to the Commonwealth of Learning. For that all human Actions ſeem to be divided like *Themiſtocles and his Company*, one Man can fiddle, [another play upon the *Bagpipes*,] another make a ſmall Town a great City, [another play on the Jews Harp, or play the *Jack-pudding*,] and he that can do neither one Thing nor the other, deſerves to be *kicked* out of Creation. That the avoiding which *Penalty* has doubtleſs given the firſt Birth (ſays Dr. *Swift*) to the Nation of Critics, and withal an Occaſion for their *ſecret* Detractors to report, that a *true Critic* is a Sort of *Mechanic*, ſet up with *Stock* and *Tools* for his Trade, at as little Expence as a *Taylor*; and that there is much the ſame *Analogy* between the Utenſils and Abilities of both. For the Taylor's Hell is the Type of a Critic's common Place Book, and his *Wit* and Learning held forth by the *Gooſe*: That it requires at leaſt as many of theſe to the making up *one* Scholar, as of the others to the Compoſition of a Man. That the Value of both is equal, and their Weapons nearly of a Size. That much may be ſaid *in Anſwer to theſe invidious Reflections*; that, on ſecond Conſideration, Dr. *Swift* can affirm the firſt Aſſertion to be a *Falſhood*; for that on the contrary, Nothing is more certain than that it requires greater laying out, to be free of the *Critic*'s Company than of any other you can name. For, as to the *true Beggar*, it will coſt the richeſt Candidate every Groat he is worth; ſo, that before one can commence a *true Critic* it will coſt a Man all the *good Qualities of his Mind*; which perhaps for a leſs Purchaſe, would be thought but an *indifferent Bargain*. Dr. *Swift* having thus amply proved the Antiquity of Criticiſm, *(beſides by other Arguments which, to avoid taking up too much of your Readers* Time *and* Patience, *I have omitted)* and deſcribed the primitive State of it; he next proceeds to examine the *preſent* Condition of the *Empire* of Criticiſm, and to ſhew how well it agrees with its antient Self. That a *certain* Author, whoſe Works have many Ages ſince been entirely loſt, does, in his *fifth* Book and *eighth* Chapter, ſay of *Critics*, that *their Writings are the Mirror of Learning*. This Dr. *Swift* underſtands in a *literal* Senſe, and ſuppoſes that *Author* muſt mean, that whoever deſigns to be a perfect Writer, muſt inſpect into the Books of Critics [*hypercritical Monthly Reviews, &c.*] and correct his Intention there as in a *Mirror*. — That whoever conſiders that the *Mirrors* of the Antients were made of *Braſs*, and *ſine Mercurio*, may preſently apply the two principal Qualifications of a true modern *Critic*, and conſequently muſt needs conclude, that theſe have always been, and muſt be for ever the ſame. For that *Braſs* is an Emblem of Duration, that, when it is ſkilfully burniſhed, will caſt *Reflections* from its own Superficies without any Aſſiſtance of *Mercury* from behind. That all the other *Talents* of a [*ſmall Wit*] *modern Critic* will not require a particular Mention, being included or eaſily deducible to theſe.

' However, Dr. *Swift*, concludes with three *Maxims*, which, he ſays, may ſerve both as *Characteriſtics* to diſtinguiſh a true *modern Critic* from a PRETENDER; which, he ſays, will alſo be of admirable Uſe to thoſe worthy Spirits, ‘who engage [like the *hypercritical Monthly Reviewers*] in ſo uſeful and honourable an Art.

‘The *firſt*, he ſaith, is that *Criticiſm* contrary to all other Faculties of the *Intellect*, is ever held the *trueſt* and *beſt*, when it is the very firſt Reſult of the Critic's Mind; as *Fowlers* reckon the firſt Aim for the ſureſt, and ſeldom fail of miſſing the Mark if they ſtay for a *ſecond*.

‘*Secondly*, that the *true Critics* are known by their Talent of *ſwarming* about the *beſt Writers* in their Subject, to which they are carried merely by *Inſtinct*; as a *Rat* is carried to the beſt Cheeſe, or a *Waſp* to the faireſt Fruit. As when the KING is on *Horſeback* he is ſure to be the dirtieſt Perſon of the Company; and thoſe that make their Court *beſt* to him, are ſuch as *beſpatter* him moſt.

‘*Thirdly* and *laſtly*, that a *true Critic* in the Peruſal of a Book, is like a *Dog at a Feaſt*, whoſe Thoughts and *Stomach* are wholly ſet upon what the *Gueſts* fling away; and that, conſequently is apt to *ſnarl* moſt when there are the *feweſt* Bones for his Prey.

‘That by the Word *Critic*, at this Day, ſo frequent in all Converſations, there have ſometimes been diſtinguiſhed three very different *Species* of mortal Men, according to Dr. *Swift*'s reading in antient *Books* and *Pamphlets*.

‘*Firſt*, by this Term were underſtood ſuch Perſons as invented or drew up *Rules* for themſelves and the World, by obſerving which a careful Reader might be able to pronounce upon Productions of the *Learned*, form his Taſte to a true Reliſh of the *ſublime* and admirable! and divide every Beauty of Matter, or of Style, from the Corruption that apes it. That in their common Peruſal of Books, ſingling out the Errors and Defects, the *nauſeous*, the *fulſome*, the *dull*, and the *impertinent*; [giving infinite Satisfaction, like the *hypercritical Reviewers*] with the Caution of a Man walking through the Streets of *Edinburgh* in the Morning, who is as careful as he can to watch diligently, and ſpy out the *Filth in his Way*, not that he is curious to obſerve the *Colour* and *Complexion* of the *Thing*, or take its Dimenſions; much leſs to be *padling* in, or *taſting* it; but only with a Deſign to come out as cleanly as he may.

‘That theſe Men, though very *erroneouſly*, to have underſtood the Appellation of *Critic* in a literal Senſe; that one *principal* Part of his Office was to *praiſe* and *acquit*; and that a *Critic*, who ſets up to read only for an Occaſion of *Cenſure* and *Reproof*, is a *Creature* as barbarous as a *Judge*, who ſhould take up a Reſolution to *hang* all Men that came before him on a Trial.

‘Again, that by the Word *Critic* have been meant the *Reſtorers* of antient Learning from the *Worms* and *Graves* and *Duſt* of Manuſcripts.

‘That, now the Races of theſe two have been for ſome Ages utterly *extinct*; that beſides to diſcourſe any farther of them would not be at all to Dr. *Swift*'s preſent Purpoſe.

‘That, the *third* and nobler Sort is of the TRUE CRITIC, whoſe *Original* is the moſt antient of all. That every *true Critic* is a *Hero* born deſcending in a direct Line from a *cœleſtial* Stem, by *Momus* and *Hybris*, who begat *Zoilus*, who begat *Tigellius*, who begat *Et cætera* the *Elder*, who begat *Bentley*, and *Rhymer*, and *Perrault*, and *Dennis*, and *Gryphus*, and *Smallwit*, who begat *Et cætera* the younger.

‘That, theſe are the *Critics* from whom the *Commonwealth* of Learning has, in all Ages, received ſuch immenſe Benefits, that the *Gratitude* of their Admirers placed their Origin in Heaven, among thoſe of *Hercules*, *Theſeus*, *Perſeus*, and other great Deſervers of Mankind.

‘Nevertheleſs, that *heroic Virtue* itſelf hath not been exempt from the *Obloquy* of evil Tongues: For it *hath* been objected, that thoſe *antient Heroes*, famous for their combating ſo many *Giants*, and *Dragons*, and *Robbers*, were in their own Perſons a greater *Nuſance* to Mankind than any of thoſe *Monſters* they ſubdued. And therefore to render their *Obligations* more complete, when all other *Vermin* were deſtroyed, ſhould, in *Conſcience*, have concluded with the ſame Juſtice upon themſelves, as *Hercules* moſt generouſly did, and hath upon that Score, procured to himſelf more *Temples* and *Votaries* than the beſt of his Fellows. For which Reaſon Dr. *Swift* ſuppoſes it is, why ſome have conceived it would be very expedient *for the public Good of Learning*, [which muſt be ſubmitted to the *hypercritical Monthly Reviewers*] that every true *Critic*, as ſoon as he has finiſhed his *Taſk* aſſigned, ſhould immediately deliver himſelf up to *Ratſbane* or *Hemp*, or from ſome convenient *Altitude*; [as a *Priſon* might help to refine his Sentiments and *Morals*;] and that no Man's *Pretenſions* to ſo *illuſtrious a Character* ſhould, by any Means, be received before the Operations were performed.

‘That, from the *heavenly Deſcent of Critics*, and the cloſe Analogy it bears to *heroic Virtue*, it is eaſy to aſſign the Employment of a *true*, *antient*, *genuine* Critic; which is to travel through this vaſt World of Writings, to purſue and hunt thoſe *monſtrous Faults* bred within; to drag out the *lurking Errors*, like *Cacus* from his Den, to multiply them like *Hydras* Heads, and rake them together like *Augea*'s Filth; or elſe drive away a Sort of *dangerous Fowl*, who have a perverſe Inclination to plunder the *beſt Branches* of the *Tree of Knowledge*; like thoſe *Stymphalian* Birds that eat up the *Fruit*, [or like thoſe *Harpies*, from ſome of whom, under the *Roſe*, the *voracious* Critics receive their daily Food.’]

For the INFINITE SATISFACTION *of the* PUBLIC.

☞ *At the* Pedlar's Pony, *near* Eagle-Court, *in the* Strand, ſoon will be publiſhed, The *Hypercritical and Anticritical Monthly Review*; containing the *Quinteſſence* and *Marrow* of all true *Cavil* and *Criticiſm*.

By *Gryphus Mac Gregor*.

I am, Sir,

Blenchland, near *Hexham*,
Northumberland.
September 1, 1762.

Your humble Servant,

THOMAS MARSHALL,

Champion-Critic.

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An

An *Alphabetical* TIDE-TABLE: Shewing the *Time* of HIGH-WATER at the following *Places*, at *New* and *Full Moon*.

Places Names.	T. H. Water		Places Names	T. H. Water		Places Names	T. H. Water		Places Names.	T. H. Water	
A.	h	m		h	m		h	m		h	m
Aberdeen	0	45	Exwater	7	30	Milford	5	15	Swin	0	0
Aldborough	9	45	F.			—— Haven	7	30	T.		
Amſterdam	3	0	Falmouth	5	30	Mount's Bay	4	30	Tees Mouth	3	0
Andrews, St.	2	15	Flamborough	4	0	Mouſehole	4	30	Thames Mo.	1	30
Archangel	6	0	Fluſhing [H.	1	0	N.			Tinmouth	1	30
B.			Foreland N &	9	45	Naze	11	15	Topſham	6	0
Barfleur	7	30	Foulneſs [S.	6	45	Needles	10	0	Torbay	6	0
Beachy	0	0	Fowey	5	30	Newcaſtle	3	15	V.		
Bell Iſle	3	30	Firth	11	0	Newport, Iſle			Uſhant withⁿ	4	30
Berwick	2	15	G.			of Wight	0	0	W.		
Blackneſs	1	30	Gouries Gut	2	30	Nore, W. En	0	0	Wales	5	15
Blakeney	6	0	Graveſend	1	30	O.			Waſh, Linc.	6	30
Bridgewater	7	40	Guernſey	1	30	Orfordneſs	10	30	Waterford	6	30
Bridlinton P.	4	0	Gunfleet	10	30	Orkneys	6	0	Wells	6	0
Briſtol	6	30	H.			P.			Weymouth	7	0
Briſtol Key	6	45	Hamborough	6	0	Plymouth	6	0	—— Key	6	45
Buchaneſs	3	0	Harborough	6	0	Portland	8	30	Whitby	3	0
Buoy of Nore	1	0	Hartlepool	3	0	Portſmouth	12	30	Wieringham	7	0
C.			Harwich	11	0	Q.			Wight, Iſle	0	0
Calais	11	30	Haſtings	10	30	Queenborou'	0	0	Winchelſea	0	45
Cape Clear	4	30	St. Helens	10	30	R.			Winterton	8	0
Caſketswithᵗ	8	15	Holy Head	1	30	Ramekins	1	30	Y.		
—— within	9	45	Hull	6	0	Redſand	0	30	Yarmouth	10	0
Catneſs	9	0	Humber Mo	5	15	Rocheſter	0	45	—— Roads	10	30
Cork	6	30	I.			Romney	1	30			
Cowes	10	30	Ireland, S Co.	5	15	Rye	11	15			
Cromer	7	0	K.			S.					
D.			Kent.Knock	0	0	St.David'sH.	6	0			
Dartmouth	6	30	Kinſale	5	15	St. Helen's	10	30			
David's Head	6	0	L.			Sandwich	11	30			
Deal	10	30	Landſend	7	30	Scarborough	3	45			
Dover	11	30	Leoſtoff	9	45	Scilly Iſland	3	45			
Downs	1	15	—— Road	10	30	Severn's Mo	6	0			
Dublin Bar	9	15	Lime	7	0	Sheerneſs	0	0			
—Cuſt.houſe	11	0	Lizard	7	30	Shetland	3	0			
Dunbar	2	0	London	2	30	Shoe-Bacon	0	30			
Dundee	2	15	Loo	6	0	Shoreham	10	30			
Dungeneſs	9	45	Lundey	5	15	Southampton	0	0			
Dunkirk	12	0	Lynn, Norf.	6	0	Spithead	11	30			
Dunnoſe	9	45	Lynn withᵗ	5	15	Staples	3	45			
E.			M.			Spits	0	0			
Edinburgh	4	30	Maze	3	0	Spurn	5	15			
Eſtaple	11	0	Man Iſle	9	0	Start	6	45			
Exmouth	6	20	MargaretRo.	11	15	Stockton	5	15			

To find the Time of High Water at any Day of the Moon's Age at any of the foregoing Places.

RULE. Add the Time of High Water for any of the foregoing Places, at Full and New Moon, in the above Table, to the Time of the Moon's Southing, on any Day of her Age, and the *Sum* will be the Time of *High Water* for that Day.

ROYAL

ROYAL EPHEMERIS, or STATE of the HEAVENS, for the *Royal Obſervatory* at *Greenwich*, 1763.

Aſtronomical NEW, FULL, and QUARTER MOONS, or LUNATIONS for 1763, New Style.

D.	January.	Moons.	D.	February.	Moons.	D.	March.	Moons.
6	5^h 29^m A.	Laſt Q.	4	3^h 47^m A.	Laſt Q.	6	4^h 9^m A.	Laſt Q.
14	2 49 M.	New	12	10 15 A.	New	14	4 48 A.	New
22	8 39 M.	Firſt Q.	21	1 49 M.	Firſt Q.	22	3 43 A.	Firſt Q.
29	11 59 M.	Full	27	10 20 A.	Full	29	7 30 M.	Full
D.	April.		D.	May.		D.	June.	
5	6 26 M.	Laſt Q.	5	0 24 M.	Laſt Q.	3	3 12 A.	Laſt Q.
13	10 28 M.	New	13	1 23 M.	New	11	1 25 A.	New
21	1 13 M.	Firſt Q.	20	6 1 M.	Firſt Q.	18	0 43 A.	Firſt Q.
27	5 24 A.	Full	27	1 40 M.	Full	25	11 23 M.	Full
D.	July.		D.	Auguſt.		D.	September.	
3	8 23 M.	Laſt Q.	2	1 17 M.	Laſt Q.	7	4 9 A.	New
10	11 31 A.	New	9	8 3 M.	New	14	8 18 M.	Firſt Q.
17	5 37 A.	Firſt Q.	15	11 39 A.	Firſt Q.	22	5 1 M.	Full
24	10 52 A.	Full	23	0 38 A.	Full	30	6 49 M.	Laſt Q.
			31	4 53 A.	Laſt Q.			
D.	October.		D.	November.		D.	December.	
7	1 2 M.	New	5	10 43 M.	New	4	9 32 A.	New
13	8 9 A.	Firſt Q.	12	11 55 M.	Firſt Q.	11	4 12 A.	Firſt Q.
21	10 58 A.	Full	20	5 6 A.	Full	20	9 15 M.	Full
29	6 44 A.	Laſt Q.	28	4 10 M.	Laſt Q.	27	1 42 A.	Laſt Q.

Note, A. ſtands for Afternoon, and M. for Morning.

II. ECLIPSES of the SUN only.

I. *April* 13, viſible in *Africa*, and towards the extreme Southern Parts of *Europe*.

II. *October* 7, viſible in *South America*, and not viſible in *Europe*.

See P. 69 and 70, of the *Appearance* of theſe *Eclipſes*, computed by *J. Metcalfe*, from the *Tables* in our *Aſtronomer and Navigator*.

☞ All Perſons who compute Eclipſes or other *Phænomena* ſhould always be ſure to mention the Tables they are computed by, or their Exactneſs cannot be judged of.

A TABLE for finding the Difference of LONGITUDE from *Greenwich*, by the Difference of Times between the Eclipſes of the firſt Satellite of *Jupiter* for *Greenwich* and thoſe of the ſame Satellite obſerved under a diſtant Meridian.

Times of the ECLIPSES of the firſt SATELLITE of JUPITER, for 1763, N. S. at *Greenwich* Obſervatory.

	January.				February.				March.				April.			May.		June.		
	Emerſion.				Emerſion.				Emerſion.				Emerſion.					Immerſi^{n}		
D.	h	m	s	D.	h	m	s	D.	h	m	s	D.	h	m	s	till 11th of	D	h	m	s
1	1	19	2	1	21	48	31	2	5	32	53	1	7	53	2	*June* next.	11	1	9	30
2	19	47	4	3	16	17	12	4	0	2	11	3	2	22	27	The 2d,	12	19	29	48
4	14	15	7	5	10*	45	35	5	18	31	31	4	20	51	51	3d, & 4th	14	13	58	5
6	8*	43	11	7	5	14	41	7	13	0	53	6	15	21	14	Satellites	16	8	26	22
8	3	11	16	8	23	43	30	9	7*	30	16	8	9	50	35	cannot be	18	2	54	38
9	21	39	23	10	18	12	21	11	1	59	40	10	4	19	55	ſeen for	19	21	22	54
11	16	7	32	12	12	41	15	12	20	29	6	11	22	49	14	the ſame	21	15	51	10
13	10*	35	44	14	7*	9	12	14	14	58	32	13	17	18	32	Cauſe fr.	23	10	19	25
15	5*	3	58	16	1	39	12	16	9	27	58	15	11	47	49	the 18th	25	3	47	40
16	23	32	14	17	20	8	16	18	3	57	25	17	6	47	5	20th, and	26	23	15	55
18	18	0	32	19	14	37	24	19	22	26	52	19	0	46	21	22d of	28	17	44	10
20	12*	28	52	21	9*	6	35	21	16	56	19		*Jupiter* is			*May*, til	30	12	12	24
22	6	57	15	23	3	35	48	23	11	25	46		now ſo			28, 24, &				
24	1	25	41	24	22	5	2	25	5	55	14		near the			28th of				
25	19	54	10	26	16	34	17	27	0	24	42		Sun, that			*June* fol				
27	14	22	41	28	11*	3	34	28	18	54	9		his 1ſt *Sa-*			lowing,				
29	8	51	15					30	13	23	36		*tellite* can-			reſpective-				
31	3	19	52										not be ſeen			ly.				

	July.				Auguſt.				September				October.				November				December		
	Immerſi^{n}				Immerſi^{n}				Immerſi^{n}				Immerſi^{n}				Immerſi^{n}.				Immerſi^{n}.		
D.	h	m	s	D.	h	m	s	D.	h	m	s	D.	h	m	s	D.	h	m	s	D.	h	m	s
2	6	40	38	1	8	43	38	2	5	23	2	2	7	37	6	1	9*	46	12	1	11*	45	31
4	1	9	52	3	3	12	15	3	0	52	7	4	2	6	3	3	4	14	41		*Emerſion*		
5	19	36	7	4	21	40	54	6	18	21	13	5	20	35	0	4	22	43	8	5	2	49	45
7	14*	5	23	6	16*	9	35	7	12*	50	20	7	15*	3	55	6	17	11	33	6	21	17	34
9	8	33	41	8	10	38	18	9	7	19	27	9	9*	32	49	8	11*	39	57	8	15*	45	23
11	3	2	1	10	5	7	4	11	1	48	33	11	4	1	42	10	6*	8	18	10	10*	13	12
12	21	30	22	11	23	35	52	12	20	17	38	12	22	30	34	12	0	36	37	12	4*	41	1
14	15*	58	45	13	18	4	41	14	14*	46	42	14	16*	59	24	13	19	4	53	13	23	8	49
16	10	27	10	15	12*	33	31	16	9	15	45	16	11*	28	13	15	13*	33	7	15	17*	36	37
18	4	55	36	17	7	2	22	18	3	44	49	18	5	57	0	17	8*	1	18	17	12*	4	24
19	23	24	3	19	1	39	15	19	22	13	53	20	0	25	45	19	2	29	27	19	6*	32	10
21	17	52	30	20	20	0	9	21	16*	42	57	21	18	54	29	20	20	57	33	21	0	59	55
23	12	20	58	22	14*	29	4	23	11	12	1	23	13*	23	11	22	15*	25	37	22	19*	27	40
25	6	49	27	24	8	58	0	25	5*	41	4	25	7	51	52	24	9*	53	40	24	13*	55	26
27	1	17	57	26	3	26	57	27	0	10	6	27	2	20	30	26	4	21	41	26	8*	23	12
28	12	46	29	27	20	55	56	28	18	39	7	28	20	49	6	27	22	49	40	28	2	50	59
30	14*	15	3	29	16*	24	56	30	13*	8	7	30	15*	17	40	29	17	17	37	29	21	18	48
				31	10	53	58													31	15*	46	38

The *Aſteriſm* (*) is placed againſt the Eclipſes of the 1ſt *Satellite* of *Jupiter*, viſible at *Greenwich* Obſervatory. — In which it is obſervable, that theſe *Eclipſes*, according to the *French* Obſervations, in general, differ by about 2^{m} later than thoſe computed by *Halley*'s or other Tables. — Theſe Eclipſes being found to agree neareſt Obſervation.

D.	January.		February		March		April		May		June	
	☽ South	Decl. Noon.	☽ South	Decl. at N.	☽ South	Decl. Noon.	☽ South	Decl. Noon.	☽ South	Decl. Noon.	☽ South	Decl. Noon.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′	h m	° ′	h m	° ′
1	14 4	24n55	15 11	4n40	13 54	0n31	15 21	21S47	15 53	28S19	17 19	20S13
2	15 1	20 48	16 0	2S 9	14 44	6S32	16 19	25 34	16 51	27 53	18 1	15 37
3	15 54	15 28	16 49	8 50	15 35	13 4	17 15	27 41	17 47	26 3	18 42	10 27
4	16 43	9 18	17 39	14 52	16 29	18 44	18 11	28 22	18 37	23 0	19 21	5 4
5	17 31	2 19	18 30	20 2	17 23	23 15	19 2	27 27	19 24	18 54	20 1	0n31
6	18 17	3S50	19 24	24 2	18 19	26 23	19 52	25 11	20 7	14 10	20 44	6 12
7	19 5	10 12	20 19	26 47	19 14	28 3	20 37	21 49	20 46	9 0	21 27	11 35
8	19 54	15 59	21 14	28 2	20 7	28 11	21 20	17 36	21 26	3 28	22 15	16 43
9	20 45	20 48	22 6	27 50	20 59	26 51	22 3	13 39	22 7	2n 7	23 6	21 16
10	21 38	24 36	22 55	26 13	21 45	24 4	22 43	7 25	22 50	7 47	☌	24 55
11	22 33	27 4	23 43	23 34	22 30	20 49	23 23	1 52	23 34	13 14	0 2	27 21
12	23 28	27 59	☌	19 35	23 13	16 19	☌	3n48	☌	28 11	0 58	28 16
13	☌	27 26	0 28	15 1	23 54	11 21	0 2	9 23	0 21	22 29	1 56	27 29
14	0 31	25 19	1 11	9 57	☌	5 56	0 45	14 42	1 12	25 41	2 22	25 52
15	1 20	22 27	1 51	4 31	0 34	0 21	1 30	19 30	2 6	27 39	3 48	21 4
16	1 56	18 26	2 30	0n59	1 15	5n16	2 23	23 32	3 5	28 18	4 40	16 55
17	2 37	13 43	3 9	6 36	1 55	10 48	3 14	26 29	4 5	27 9	5 30	9 53
18	3 18	8 33	3 51	12 1	2 38	15 56	4 11	28 8	5 1	24 22	6 16	3 20
19	3 57	3 7	4 35	17 4	3 25	20 23	5 8	28 15	5 52	20 9	7 3	3S19
20	4 37	2n25	5 23	21 10	4 15	24 33	6 5	26 42	6 43	14 48	7 51	9 44
21	5 16	7 58	6 16	25 16	5 9	26 59	7 2	23 34	7 33	8 38	8 41	15 53
22	5 59	13 21	7 13	27 30	6 7	28 16	7 57	18 59	8 22	1 55	9 34	21 5
23	6 44	18 18	8 13	28 13	7 8	27 58	8 49	13 13	9 12	4S54	10 29	25 3
24	7 35	22 34	9 13	27 16	8 6	25 43	9 40	6 40	10 3	11 31	11 26	27 29
25	8 39	22 52	10 14	24 31	9 4	22 12	10 30	0S15	10 57	17 32	12 25	28 15
26	9 30	27 42	11 12	20 5	9 58	17 3	11 19	7 18	11 53	22 30	13 21	27 22
27	10 32	27 54	12 7	14 24	10 50	10 44	12 9	13 55	12 52	26 3	14 15	25 2
28	11 34	26 12	13 2	7 37	11 43	3 42	13 2	19 16	13 51	27 58	15 4	21 28
29	12 34	22 39	☽ Sem. Diam. to Hor. Par. as 15′ to 55′ 30″		12 36	3S21	13 57	23 32	14 59	28 11	15 49	17 5
30	13 30	17 36			13 30	10 20	14 53	26 33	15 41	26 46	16 31	12 4
31	14 22	11 26			14 25	16 36			16 32	23 59		

D.	☽ S D inDeg.	In T.	D.	☽ S.D inDeg.	In T.	D.	☽ S.D inDeg.	In T.	D.	☽ S.D InDeg	In T.	D.	☽ S.D inDeg.	In T.	D.	☽ S.D inDeg.	In Time
	′ ″	s		′ ″	s		′ ″	s		′ ″	s		′ ″	s		′ ″	s
1	16 23	75	1	16 32	69	1	16 42	69	1	16 8	72	1	15 40	74	1	15 3	66
3	16 23	70	3	16 9	68	3	16 17	69	3	15 38	73	3	15 12	70	3	14 49	62
5	16 9	67	5	15 43	69	5	15 47	71	5	15 9	71	5	14 53	64	5	14 49	61
7	15 54	67	7	15 21	72	7	15 17	72	7	14 52	66	7	14 47	61	7	14 58	63
9	15 36	69	17	14 50	62	9	15 0	69	17	15 19	71	16	15 37	74	15	16 2	71
18	14 47	61	19	15 2	65	18	14 58	64	19	15 37	73	18	15 50	72	17	16 5	68
20	14 49	61	21	15 25	71	20	15 13	71	21	15 57	72	20	16 2	69	19	16 7	67
22	15 4	64	23	15 56	75	22	15 34	74	23	16 19	68	22	16 14	67	21	16 5	69
24	15 29	70	25	16 27	75	24	16 3	74	25	16 33	68	24	16 19	69	23	15 57	73
26	16 0	75	27	16 45	72	26	16 29	71	27	16 23	70	26	16 11	73	25	15 41	74
28	16 28	76				28	16 43	66	29	16 12	73	28	15 51	74	27	15 20	70
30	16 39	72				30	16 36	70				30	15 24	72	29	15 1	65

D.	July.		August.		September.		October.		November.		December.	
	☽ South	Decl. Noon.	☽ South	Decl. Noon	☽ South	Decl. Noon	☽ South	Decl. Noon	☽ South	Decl. Noon	☽ Sout	Del. Noon
	h m	° ′	h m	° ′	h m	° ′	h m	° ′	h m	° ′	h m	° ′
1	17 10	6S40	17 48	13n44	19 8	27n32	19 5	26n40	21 49	8n47	21 40	9S40
2	17 51	1 7	18 34	18 30	20 5	28 30	20 52	23 24	22 11	1 49	22 35	16 3
3	18 31	4n33	19 26	22 42	21 6	27 52	21 46	18 40	23 4	5S18	23 34	21 31
4	19 13	10 0	20 20	25 55	22 5	25 31	22 38	12 42	23 58	12 13	☌	25 34
5	19 57	15 13	21 18	27 54	23 2	21 34	23 31	5 55	☌	18 24	0 35	27 56
6	20 46	19 51	22 17	28 19	23 56	16 7	☌	1S20	0 58	23 26	1 37	28 25
7	21 40	23 51	23 17	27 1	☌	9 40	0 24	8 33	1 59	26 52	2 35	27 4
8	22 37	26 41	☌	23 55	0 47	2 26	1 19	15 13	3 2	28 27	3 30	24 14
9	23 37	28 10	0 12	19 16	1 38	4S45	2 16	20 53	4 2	28 11	4 20	20 13
10	☌	27 57	1 9	13 26	2 28	11 30	3 14	25 14	4 58	26 16	5 5	15 25
11	0 37	26 58	2 0	6 45	3 20	17 39	4 15	27 48	5 49	23 5	5 47	10 6
12	1 36	22 18	2 51	0S13	4 15	22 21	5 13	28 38	6 36	18 49	6 26	4 33
13	2 29	17 18	3 41	7 6	5 15	26 13	6 11	27 47	7 19	13 56	7 4	1n 5
14	3 19	11 19	3 32	13 33	6 15	28 13	7 5	25 27	8 0	8 38	7 42	6 41
15	4 9	4 43	5 25	19 11	7 13	28 41	7 54	21 56	8 39	3 0	8 24	12 3
16	4 58	2S 2	6 19	23 38	8 9	27 16	8 40	17 34	9 18	2n38	9 8	17 4
17	5 47	8 39	7 15	26 45	9 0	24 36	9 24	12 35	9 56	8 11	9 53	21 26
18	6 38	14 48	8 12	28 17	9 47	20 55	10 2	7 10	10 37	13 31	10 42	24 59
19	7 31	20 8	9 8	28 14	10 30	16 22	10 41	1 32	11 22	18 25	11 36	27 21
20	8 26	24 18	10 3	26 37	11 12	11 12	11 21	4n 7	12 10	22 34	12 32	28 24
21	9 25	27 3	10 53	23 43	11 52	5 43	12 2	9 38	13 3	25 48	13 29	27 51
22	10 23	28 15	11 40	19 45	12 33	0 5	12 44	14 53	13 57	27 52	14 24	25 46
23	11 20	27 50	12 24	15 39	13 12	5n37	13 30	19 36	14 53	28 28	15 17	22 11
24	12 13	25 53	13 5	9 46	13 53	11 3	14 19	23 0	15 48	27 36	16 8	17 22
25	13 0	22 40	13 46	4 22	14 37	16 8	15 10	26 31	16 40	25 10	16 59	11 35
26	13 45	18 28	14 26	1n28	15 25	20 41	16 5	28 15	17 31	21 19	17 43	5 13
27	14 27	13 34	15 8	7 4	16 16	24 25	16 59	28 32	18 20	16 20	18 31	1S25
28	15 6	8 14	15 50	12 25	17 10	27 5	17 56	27 17	19 10	10 53	19 21	8 6
29	15 45	2 40	16 35	17 27	18 5	28 28	18 50	24 31	19 59	3 56	20 12	14 24
30	16 25	3n 1	17 22	21 32	19 2	28 24	19 42	20 22	20 48	2S59	21 6	19 56
31	17 5	8 29	18 14	25 12			20 32	14 59			22 4	24 23

D.	☽ S D in Deg	in T.	D.	☽ S.D in Deg	in T.	D.	☽ S.D in Deg	in T.	D.	☽ S.D in Deg	in T.	D.	☽ S.D in Deg	in T.	D.	☽ S.D in Deg	In Time.
	′ ″	s		′ ″	s		′ ″	s		′ ″	s		′ ″	s		′ ″	s
1	14 49	61	1	14 51	63	1	15 19	62	1	15 44	63	1	16 19	68	8	15 32	71
3	14 47	61	3	15 8	69	3	15 47	75	10	16 12	75	10	15 33	71	10	15 7	75
5	14 59	64	5	15 35	73	11	16 19	71	12	15 43	75	12	15 5	66	12	14 50	61
7	15 20	70	14	16 10	69	13	15 53	74	14	15 16	70	14	14 51	62	14	14 47	61
16	16 9	67	16	15 49	72	15	15 26	73	16	14 57	65	16	14 46	60	16	14 52	64
18	15 59	69	18	15 30	73	17	15 8	69	18	14 49	61	18	14 49	63	18	15 7	69
20	15 47	72	20	15 14	71	19	14 55	64	20	14 47	61	20	15 0	68	20	15 25	73
22	15 34	74	22	15 3	66	22	14 49	61	22	14 50	64	22	15 12	72	22	15 39	72
24	15 20	70	24	14 52	62	23	14 48	61	24	14 58	68	24	15 25	72	24	15 52	69
26	15 2	65	26	14 46	61	25	14 50	64	26	15 10	71	26	15 41	70	26	16 0	66
28	14 51	61	28	14 47	63	27	14 59	68	28	15 28	72	28	15 58	67	28	16 8	67
30	14 46	61	30	14 57	67	29	15 16	73	30	15 52	70	30	16 17	68	30	16 11	72

	♄		♃		♂		♀		☿	
	South	Decl.	South	Decl.	South	Decl.	South	Decl.	South	Decl.
D.	h m	° ′	h m	° ′	h m	° ′	h m	° ′	h m	° ′
JANUARY.										
1	6 22	4N 42	7 8	10N 43	3 4	14S 10	1 8	17S 47	23 19	24S 26
4	6 9	4 45	6 55	10 46	3 0	13 20	0 49	17 20	23 27	24 36
7	5 56	4 48	6 43	10 48	2 56	12 30	0 29	16 55	23 35	24 33
10	5 44	4 51	6 31	10 51	2 51	11 38	0 8	16 30	23 42	24 16
13	5 31	4 54	6 19	10 5[illegible]	2 47	10 46	23 40	16 6	23 50	23 48
16	5 18	4 58	6 6	11 0	2 42	9 52	23 19	15 45	23 59	23 19
19	5 6	5 2	6 54	11 5	2 38	8 58	22 59	15 34	0 6	22 14
22	4 54	5 6	5 42	11 11	2 33	8 3	22 41	15 30	0 14	21 3
25	4 42	5 10	5 31	11 18	2 29	7 7	22 21	15 33	0 23	19 36
28	4 30	5 15	5 20	11 25	2 25	6 12	22 11	15 38	0 32	17 58
FEBRUARY.										
1	4 15	5N 23	5 5	11N 35	2 21	4S 58	21 55	15S 45	0 43	15S 28
4	4 4	5 29	4 54	11 43	2 17	4 0	21 43	15 51	0 51	13 19
7	3 53	5 36	4 44	11 51	2 13	3 3	21 33	16 1	0 58	11 4
10	3 42	5 42	4 34	12 0	2 10	2 7	21 26	16 11	1 3	8 45
13	3 31	5 48	4 24	12 9	2 7	1 10	21 20	16 20	1 6	6 30
16	3 20	5 54	4 14	12 18	2 4	0 14	21 14	16 29	1 7	4 32
19	3 10	6 1	4 4	12 28	2 1	0N 43	21 10	16 36	1 3	2 58
22	3 0	6 7	3 54	12 39	1 58	1 39	21 5	16 40	0 53	1 51
25	2 50	6 14	3 44	12 50	1 55	2 32	21 3	16 43	0 39	1 40
28	2 40	6 21	3 35	13 1	1 52	3 28	21 2	16 44	0 19	2 5
MARCH.										
1	2 36	6N 26	3 32	13N 6	1 50	3N 50	21 1	16S 40	0 7	2N 25
4	2 26	6 33	3 23	13 17	1 47	4 44	21 0	16 33	23 24	3 33
7	2 16	6 40	3 15	13 28	1 45	5 39	21 0	16 23	23 22	5 0
10	2 6	6 48	3 6	13 40	1 42	6 32	21 0	16 10	23 3	6 19
13	1 47	6 56	2 58	13 52	1 40	7 26	21 1	15 50	22 48	7 44
16	1 57	7 4	2 49	14 3	1 37	8 18	21 2	15 29	22 36	8 40
19	1 38	7 12	2 40	14 15	1 35	9 9	21 3	15 4	22 28	9 15
22	1 28	7 18	2 32	14 28	1 32	10 0	21 4	14 33	22 22	9 32
25	1 19	7 24	2 23	14 38	1 30	10 50	21 5	13 57	22 20	9 27
28	1 10	7 37	2 14	14 50	1 27	11 38	21 6	13 20	22 20	9 5
APRIL.										
1	0 56	7N 48	2 3	15N 6	1 23	12N 43	21 7	12S 26	22 21	8S 7
4	0 46	7 56	1 55	15 18	1 20	13 27	21 8	11 33	22 22	7 6
7	0 37	8 5	1 46	15 30	1 18	14 12	21 9	10 42	22 26	5 53
10	0 27	8 13	1 38	15 43	1 15	14 56	21 10	9 48	22 31	4 30
13	0 18	8 22	1 30	15 55	1 13	15 38	21 12	8 50	22 36	2 51
16	0 9	8 30	1 21	16 7	1 10	16 19	21 14	7 46	22 42	1 3
19	23 56	8 39	1 13	16 19	1 8	16 59	21 16	6 42	22 48	0N 52
22	23 46	8 47	1 5	16 31	1 5	17 37	21 17	5 34	22 55	3 0
25	23 36	8 56	0 56	16 43	1 3	18 13	21 19	4 24	23 3	5 14
28	23 26	9 4	0 48	16 55	1 0	18 48	21 21	3 17	23 11	7 37

⁂ *Mr.* Rivet's *Queſt. at P.* 70. *this* Pall. *admits of a Variety of very near Anſwers by the true as well as mean Year or Motion. Though it requires one computed and* exact *Anſwer, nearer than the* correcteſt *Obſervation can give.*

	♄				♃				♂				♀				☿			
	South		Decl.		South		Decl.		South		Decl.		South		Decl.		South		Decl.	
D.	h	m	°	′	h	m	°	′	h	m	°	′	h	m	°	′	h	m	°	′
M A Y.																				
1	23	16	9N	12	0	39	17N	7	0	57	19N	21	21	22	2S	5	23	26	10N	3
4	23	6	9	20	0	30	17	18	0	55	19	52	21	23	0	51	23	34	12	33
7	22	56	9	28	0	22	17	30	0	52	20	22	21	24	0N	23	23	47	15	3
10	22	45	9	35	0	13	17	41	0	49	20	51	21	26	1	42	☌		17	27
13	22	35	9	42	0	4	17	52	0	46	21	17	21	27	2	56	0	11	19	38
16	22	25	9	49	23	53	18	3	0	43	21	41	21	28	4	13	0	26	21	33
19	22	15	9	56	23	44	18	13	0	40	22	5	21	29	5	30	0	40	23	8
22	22	4	10	3	23	34	18	23	0	37	22	26	21	30	6	45	0	54	24	22
25	21	53	10	10	23	24	18	33	0	33	22	44	21	31	8	0	0	7	25	9
28	21	42	10	17	23	15	18	43	0	20	23	2	21	32	9	14	0	20	25	34
J U N E.																				
1	21	27	10N	24	23	3	18N	57	0	24	23N	22	21	34	10N	51	1	32	25N	36
4	21	16	10	30	23	52	19	6	0	21	23	35	21	35	12	1	1	40	25	18
7	21	5	10	36	22	43	19	15	0	17	23	47	21	37	13	8	1	46	24	48
10	20	54	10	42	22	34	19	24	0	14	23	56	21	38	14	15	1	47	24	7
13	20	43	10	48	22	24	19	33	0	10	24	4	21	40	15	18	1	48	23	16
16	20	32	10	54	22	14	19	42	0	7	24	9	21	41	16	9	1	46	22	22
19	20	20	11	0	22	5	19	50	0	3	24	13	21	43	17	17	1	41	21	28
22	20	9	11	5	21	55	19	58	23	56	24	14	21	45	18	11	1	32	20	33
25	19	57	11	10	21	45	20	6	23	52	24	15	21	46	19	2	1	21	19	42
28	19	46	11	14	21	35	20	14	23	49	24	13	21	48	19	39	1	7	18	55
J U L Y.																				
1	19	35	11N	18	21	27	20N	21	23	45	24N	9	21	52	20N	30	0	50	18N	21
4	19	24	11	22	21	16	20	28	23	41	24	3	21	54	21	8	0	32	17	53
7	19	12	11	25	21	6	20	35	23	38	23	55	21	57	21	38	0	12	17	40
10	19	1	11	28	20	56	20	41	23	34	23	46	22	0	22	5	23	45	17	40
13	18	49	11	31	20	46	20	47	23	30	23	35	22	3	22	27	23	26	17	47
16	18	37	11	34	20	36	20	53	23	26	23	22	22	7	22	43	23	9	18	8
19	18	25	11	37	20	27	21	58	23	23	23	8	22	10	22	52	22	56	18	38
22	18	14	11	39	20	17	21	3	23	19	22	52	22	13	22	56	22	46	19	1
25	18	2	11	41	20	8	21	8	23	16	22	34	22	17	22	54	22	48	19	48
28	17	51	11	43	19	58	19	13	23	13	22	16	22	21	22	46	22	38	20	22
A U G U S T.																				
1	17	37	11N	45	19	47	21N	19	23	8	21N	49	22	27	22N	27	22	41	20N	52
4	17	26	11	47	19	37	21	23	23	5	21	27	22	31	22	5	22	48	20	58
7	17	15	11	48	19	28	21	27	23	1	21	3	22	35	21	38	22	58	20	46
10	17	4	11	49	19	19	21	31	22	58	20	38	22	40	21	4	23	9	20	8
13	16	53	11	49	19	10	21	34	22	55	20	12	22	44	20	26	23	21	19	8
16	[illegible]	41	11	49	19	1	21	37	22	51	19	44	22	48	19	42	23	34	17	44
19	[illegible]	[illegible]	11	49	18	51	21	40	22	48	19	14	22	52	18	53	23	47	16	3
22	16	[illegible]	11	48	18	41	21	43	22	44	18	45	22	56	17	59	☌		14	2
25	16	[illegible]	11	47	18	32	21	45	22	41	18	23	23	0	16	59	0	7	11	54
28	15	57	11	45	18	22	21	48	22	38	17	41	23	5	15	56	0	19	9	39

	♄				♃				♂				♀				☿			
	South		Decl.		South		Decl.		South		Decl.		South		Decl.		South		Decl.	
D.	h	m	°	′	h	m	°	′	h	m	°	′	h	m	°	′	h	m	°	′
SEPTEMBER.																				
1	15	43	11	N42	18	11	21	N51	22	34	16	N57	23	8	14	N26	0	31	6	N34
4	15	32	11	40	18	1	21	53	22	30	16	23	23	12	13	15	0	39	4	13
7	15	31	11	38	17	51	21	55	22	27	15	48	23	15	11	59	0	47	1	55
10	15	10	11	35	17	41	21	56	22	24	15	11	23	19	10	40	0	55	0	S22
13	14	58	11	33	17	32	21	58	22	20	14	34	23	22	9	22	1	2	2	37
16	14	47	11	30	17	22	21	59	22	16	13	58	23	26	7	58	1	8	4	48
19	14	36	11	27	17	12	22	0	22	13	13	18	23	30	6	31	1	12	6	52
22	14	24	11	24	17	2	22	0	22	9	12	39	23	32	5	4	1	16	8	54
25	14	13	11	20	16	52	22	1	22	6	11	59	23	35	3	37	1	20	10	49
28	14	2	11	16	16	42	22	1	22	2	11	19	23	38	2	7	1	24	12	37
OCTOBER.																				
1	13	50	11	N13	16	31	22	N 1	21	58	10	N38	23	41	0	N33	1	28	14	S15
4	13	39	11	9	16	20	22	1	21	54	9	56	23	44	0	S54	1	30	15	47
7	13	27	11	5	16	9	22	1	21	51	9	15	23	46	2	24	1	32	17	24
10	13	15	11	0	15	57	22	1	21	47	8	35	23	49	3	55	1	32	18	15
13	13	2	10	56	15	45	22	0	21	43	7	52	23	52	5	25	1	30	19	9
16	12	51	10	51	15	34	21	59	21	39	7	8	23	55	6	54	1	27	19	43
19	12	39	10	46	15	22	21	58	21	34	6	26	23	57	8	20	1	20	19	58
22	12	26	10	41	15	10	21	57	21	30	5	42		6	9	45	1	9	19	41
25	12	14	10	36	14	58	21	56	21	25	4	59	0	2	11	10	0	53	18	51
28	12	1	10	31	14	46	21	55	21	20	4	16	0	5	12	44	0	32	17	21
NOVEMBER.																				
1	11	44	10	N23	14	29	21	N53	21	13	3	N18	0	8	14	S 7	23	58	14	S30
4	11	31	10	19	14	16	21	51	21	8	2	34	0	11	15	30	23	25	12	28
7	11	18	10	15	14	3	21	49	21	3	1	42	0	14	16	42	23	6	10	45
10	11	6	10	11	13	49	21	47	20	58	1	8	0	17	17	50	22	54	9	58
13	10	53	10	6	13	36	21	45	20	53	0	25	0	20	18	52	22	47	10	6
16	10	40	10	2	13	22	21	43	20	48	0	S18	0	23	19	50	22	44	10	48
17	10	26	9	58	13	8	21	40	20	42	1	1	0	26	20	44	22	45	11	57
22	10	13	9	54	12	54	21	38	20	36	1	44	0	29	21	32	22	47	13	26
25	9	59	9	50	12	40	21	35	20	30	2	26	0	32	22	14	22	51	14	48
28	9	46	9	47	12	25	21	32	20	24	3	9	0	35	22	40	22	55	16	18
DECEMBER.																				
1	9	33	9	N44	12	9	21	N29	20	17	3	S51	0	39	23	S21	23	0	17	S47
4	9	20	9	41	11	54	21	26	20	11	4	32	0	42	23	45	23	6	19	12
7	9	6	9	38	11	40	21	23	20	4	5	13	0	45	24	0	23	11	20	28
10	8	53	9	36	11	25	21	19	19	58	5	54	0	49	24	12	23	17	21	38
13	8	39	9	35	11	10	21	15	19	52	6	35	0	32	24	16	23	23	22	40
16	8	26	9	34	10	56	21	12	19	45	7	13	0	55	24	14	[illegible]	30	[illegible]	30
19	8	12	9	34	10	41	21	10	19	39	7	53	0	58	24	5	23	38	[illegible]	8
22	7	59	9	33	10	26	21	8	19	32	8	31	0	59	23	49	23	[illegible]	24	40
25	7	45	9	33	10	12	21	6	19	25	9	10	1	2	23	26	23	[illegible]	24	56
28	7	32	9	33	9	57	21	4	19	19	9	48	1	5	23	56	0	0	25	2

⁎⁎⁎ Mr. *MILLAN*'s Liſts of the *Navy* and *Army* and *Offices*, are the beſt and correcteſt; — other Liſts being a Copy of his *old ones.*

OBSERVATIONS and APPEARANCES for *Greenwich*, 1763.

D.	January.
3	☿ Aphel.
	☾ Per. in 10° ♍ 26′
9	☾ α ♏
12	☉ in ☋ ♄
17	☾ Apo. in 11° ♓ 58′
19	☉ in ♒ 17^h 11^m
	♀ Perih.
23	☉ in ‖ Whale's Tail Mean 3^h 59^m
27	♄ in mean Diſt.

⁂ See our ROYAL ASTRONOMER for correct Methods of Computation.

D.	February.
3	♃ in Limits of his Satellites
	☉ in ‖ *Sirius* at Mean 9^h 17^m.
5	♄ μ ♓ Diſ. 39′
6	☾ α ♏
14	☾ Ap. in 15° ♓ 2′
15	☽ ♂
	☿ Perih.
18	☉ in ♓ 8^h 6^m
19	☽ δ ♈
22	☉ in ‖ α ♍ at mean 14^h 39^m
26	☉ in ‖ *Rigel* at mean 6^h 16^m.

⁂ Mr. *Newberry*'s *Annual* Pocket Books excell others of the Kind.

D.	March.
4	☽ α ♏
5	☿ in mean Diſt.
10	♀ * ♑ Diſt. 7′
11	♀ τ ♑ Diſt. 16′
13	☽ Apo. in 18° ♓ 6′
15	☉ in ‖ ζ Orion, mean at 5^h 39^m
16	☉ in ‖ ε Orion, mean at 5^h 30^m
	☽ ♂
19	☌ ♂ ♄ Diſt. 2° 9′
	☉ in ‖ δ Orion, at mean 5^h 15^m
20	☉ in ♈ 8^h 40^m
22	♃ σ ♈ Diſt. 25′
23	♄ ο ♓ Diſt. 37′
27	♀ λ ♐ Diſt. 36′
	☽ Per. in 19° ♍ 38′
28	♀ η ♑ Diſt. 27′ 47″
30	☿ Aph.

D.	April.
1	☽ α ♏
3	♀ ρ ♒ Diſt. 51′
4	☉ in ‖ *Procyon* at mean 6^h 23^m
8	☉ in ‖ α Orion, at mean 4^h 25^m
10	☉ in ‖ Eagle, at mean 18^h 12^m
	☽ Apo. in 21° ♓ 18′
12	Eclipſe ☉ viſible in *Africa*
13	♀ λ ♒ Diſt. 7′
	♀ * ♒ Diſt. 6′
17	☌ ☉ ♄
	☌ ♂ ♃ Diſt. 1° 2′
18	♀ φ ♒ Diſt. 10′
19	☉ in ♉ 21^h 39^m
24	☽ Per. in 22° ♍ 42′
	☉ ‖ *Regulus* 7^h 39^m
26	♀ * ♒ Diſt. 10′
	☿ in mean Diſt.
29	☽ α ♏ Immerſion at 8^h 45^m Emerſion 9^h 49^m N. ☽ Center 9′

D.	May.
4	☿ in mean Diſt.
7	☽ Ap. in 24° ♓ 14′
8	☽ ♀, ☉ in ☋ ♂
12	♀ Aph.
14	☿ Perih.
15	♀ *e* ♓ Diſt. 21′
20	☉ in ♊ 22^h 27^m
	♀ * ♓ Diſt. 2′
21	☽ Per. in 25° ♍ 46′
22	☉ in ‖ *Arcturus*, at 9^h 59^m
24	♀ ο ♓ Diſt. 21′
25	☽ α & σ ♏
31	☌ ♀ ♄ Diſt. 1° 16′.

The *Kennedian* heretic *Aſtronomy* makes the Year tropical and Sun's Motion always equal that are variable; — 115200 *Jul.* Yrs. being 887 Revol. of the Sun's mean Place, are nearer than 1440 *Jul.* Years of 11 Revolutions.

D.	June.
1	☿ in mean Diſt.
4	☽ Ap. in 27° ♓ 18′
	☿ ι ♊ Diſt. 5′
7	♀ ω ♈ Diſt. 41′
18	☽ Per. in 29° ♍ 50′
20	☌ ☉ ♂
21	☉ in ♋ à 7^h 18^m
23	♀ ω ♉ Diſt. 15′
25	☌ ♓ ☿ Diſt. 14′
27	☿ Aphel.
28	☿ ι ♑
29	☉ in ☋ ♃
30	☉ Apog. at 4^h 16^m.

⁂ To anſwer Mr. *Rivet*'s Queſtion, a Period muſt be found, when the Sun's mean Place and Anomaly return the ſame, viz. a Revolution of the Sun's Apogee, or 21072 Julian Years.

☞ *See a* Quarto *Treatiſe of chronological and aſtronomical* Ignorance *and* Error, *founded on Methodiſt Principles, by* Antinewtonus : *as yet a* Secret *to all but Subſcribers. To be anſwered by Mr.* Ferguſon, *whoſe Errors, in his lunar Equations, with the Errors he undertakes to anſwer, will be corrected by a* mathematical *and not* mechanical Operator, *in a Treatiſe extraordinary* Antikennedian!

OBSERVATIONS and APPEARANCES for *Greenwich*, 1763. Continued.

D.	July.	D.	August.	D.	September.
2	♄ ✱ ♈ Dist. 17'	1	♀ P ♊ Dist. 29'	1	♀ Petih.
	☽ Ap. in 1° ♈ 22'	9	☿ Perih.		☉ in ‖ Eagle at 8^h 48^m
5	♀ ι ♉ Dist. 0'	12	☽ Per. in 5° ♎ 59'	2	♀ α ♌ Dist 42'
6	♀ ✱ ♉ Dist. 20'	13	☽ α ♍	3	☉ in ‖ α *Orion* at 18^h 42^m
9	♀ o ♉ Dist. 42'	15	♀ before Nebuleuse ♋	6	☽ ♀
14	☉ in ☊ ♄		☉ in ‖ *Markab*, at 13^h 3^m	7	☉ in ‖ *Procyon*, at 20^h 11^m
15	☽ Per. in 2° ♎ 54'	16	♀ δ ♋ Dist. 30'	8	☽ Per. in 9° ♎ 3'
16	♀ H ♊ Dist. 31'		☽ α & σ ♏	18	♄ ✱ ♈ Dist. 2'
18	♀ η ♊ Dist. 19'		☉ in ‖ *Algenib*, 14^h 1^m		☽ ε ♑
20	♀ μ ♊ Dist. 17'	19	☌ ♀ ♂ Dist. 27'	22	☽ Ap. in 10° ♈ 35'
	☽ α ♏	20	♃ ι ♉ Dist. 30'		☉ in ♎ 20^h 45^m
21	☉ in ‖ *Arcturus*, at 5^h 52^m	23	☉ in ♍ 0^h 28m	23	☿ Aphel.
22	☉ in ♌ at 18^h 11^m	26	☽ Ap. in 7° ♈ 31'	24	☉ in ‖ *Orion* at 17^h 9^m
23	♂ in mean Dist.	28	♆ ♌ Dist. 42'	26	☉ in ‖ ε *Orion* at 17^h 1^m
25	☽ ι ♑		☿ in his mean Dist.	28	☿ δ ♏ Dist. 1'
28	♀ ι ♊ Dist. 12'				☉ in ‖ ζ *Orion* at 16^h 58^m
29	☽ Ap. in 4° ♈ 27'				
30	♀ δ ♊ Dist. 9'				
	☽ ξ ♓				

D.	October.	D.	November.	D.	December.
6	Eclipse ☉ visible in S. *America*	1	☽ ♂ Immersion at 16^h 50^m	3	☍ ☉ ♃
	☽ Per. in 12° ♎ 7'		Emersion 17^h 49^m	4	♂ ϑ ♍ Dist. 21'
	☽ ♀		☽'s Cent. South 7'	9	☽ ε ♑
7	☽ α ♍		☽ β ♍	14	☽ Ap. in 19° ♈ 48'
8	☽ ☿	3	☽ Per. in 15° ♍ 11'	18	♂ m ♍ Dist. 20'
10	♂ γ ♌ Dist. 2'	4	♂ Aph.	20	☿ Aphel.
	☽ α ♍	6	☿ Perih.	21	☉ in ♑ at 12^h 39^m
15	☽ ι ♑	7	☉ in ‖ *Sirius* at 15^h 33^m	22	♀ Aphel.
	☉ in ‖ Rigel at 15^h 31^m	10	☉ in ☊ ♂	26	☽ β ♍
16	♂ σ ♌ Dist. 21'	12	♂ η ♍ Dist. 0'	28	☽ α ♍
19	♀ in mean Dist.	16	☽ Ap. in 16° ♈ 44'		☌ ☉ ☿ ſuperior
20	☽ ξ ♓	18	♃ ι ♉ Dist. 28'		☽ Perig. in 21° ♎ 20'
	☽ Ap. in 13° ♈ 39'		☉ in ‖ Whale's Tail, 8^h 47^m	29	☉ in ☊ ♃
23	☉ in ♏ 4^h 38^m	22	☉ in ♐ 0^h 25^m	30	☉ Perig. at 5^h 23^m.
28	☍ ☉ ♄	24	☿ in mean Dist.		
30	♂ β ♍ Dist. 4'.	30	☽ Perig. in 18° ♎ 16'		
			☽ α ♍.		

⁎ We recommend the *Newtonian Philoſophy*, by Maſter *Tommy Teleſcope*, Price 1s. ſold by Mr. *Newberry*.

⁎ *Our* Palladium *Correſpondents are deſired to continue ſending their Letters (franked or Poſt paid) directed for the* Palladium-Author, *at Mr.* Cole's, Mathematical Inſtrument Maker, Fleet-ſtreet, London. *Of whom may be had all Sorts of the beſt and neweſt improved mathematical Inſtruments, Viſion Glaſſes,* &c.

COMPUTATION of the SUN's *Entrance* into *Libra*, for *Greenwich*, 1762.

By *Tabs.* in *Royal Aſt.*	☉'s Apogee.			
For the Year 1762, N.S.	3^{s}	8°	47′	0″
By old *Ephem. Sept.* 22			+	45
M. Place Sun's Apogee	3	8	47	45
Sun's true Place	6	0	0	0
Sun's true Anomaly	2	21	12	15
Eq. ☉ true to M.Pl. P. 17, *Royal Aſt.*	+	1	54	42
☉ M.Pl. when ☉ in ♎	6	1	54	42
☉ M. Pl. 1762, N.S.	9	10	6	11
	8	21	48	31
September 22^{d} . .	8	21	11	47
			36	44
Hours 14 . . .		. .	34	30
			2	14
Minutes 54 . . .	. . .		2	13
Seconds 25 . . .	. . . .			1

P. 4. *Proof.*	☉ M. Pl.				☉ Apogee.			
R. Aſt. 1762, N.S	9^{s}	10°	6′	11	3^{s}	8°	47′	0
P. 7. *Sept.* 22	8	21	11	47				45
Hours 14			34	30				
Min. 54, Sec. 25			2	14	3	8	47	45
					6	1	54	42
Sun's M. Place	6	1	54	42				
P. 12. ☉ Eq.	—	1	54	42	2	23	6	57
					☉ M. An.			
Sun's true Pl.	6	0	0	0				

1762, *Sep.* 23^{d} 2^{h} 54^{m} 25^{s} Mor. ☉ in ♎ M. T.
— P. 19. *R. A.* + 7 47 Eq. of M. to app. T.
Rem.
— *Sep.* 23^{d} 3 . 2 . 12 Mor. ap. T. ☉ in ♎.
Rem.
— By *De la Caille* 23 3 1 Mor. for *Paris.*
Rem. — 9 Minutes.
—
Rem. *Sept.* 23 2 52 M. for *Greenwich.*

*** THE Author of the *Royal Aſtronomer and Navigator* is the *firſt* who gave a *direct* and *exact* Method of computing the Time of the Sun's *Entrance* into any one *Point* (*Sign, Degree, Minute, &c.*) of the Ecliptic.

See P. 17, 18, *Royal Aſtronomer*, for Examples of the Method of Computation. Which two Pages are entirely new.

It is no Wonder there is ſuch *Difference* in the Time of the Sun's *Entrance* into any *Point* of the Ecliptic, from *different Tables*; *ſince* 1 *Second of a Degree Diff. of Sun's Place anſwers to* 25 *Seconds Diff. in Time, and* 1 *Min. of a Degree Dif. of Place to* 25 *Min. Dif. in Time*; whereas none but the beſt Tables, made from the correcteſt Obſervations, taken at public *Obſervatories*, can *neareſt* determine Truth.

As the *public Obſervatories* are the Foundation of the only *true Aſtronomy* and *aſtronomical Computation*, (for Nothing can be truer, or more certainly known, than that which is *derived* from Obſervation, made by the trueſt Inſtruments, being Fact itſelf) how *chimerical* then muſt be the *Moſaic* Aſtronomers, who ſet up an Aſtronomy of their own, (*which is no Aſtronomy*) founded on *Illuſions* and *Theories,* (the Effect of a crazy or wrong Judgment) having no Correſpondence with Obſervation nor *Foundation in Nature.*

Whence if the *Moſaic* aſtronomical Pretenders (*Kennedy, Romaine, Hutchinſon, &c.*) were in the Right, then all our public *aſtronomical Profeſſors,* of the ſeveral public *Obſervatories* in *Europe,* eſtabliſhed by Government, would be in the wrong; and the public Money laid out for making aſtronomical Improvements, for public Uſe, would be miſemployed, if not thrown away; as the Encouragers and Promoters of thoſe Improvements, (KINGS and PRINCES) would be found in an ERROR. — Which GOD, and not *Moſes* forbid!

To eſtabliſh their Importance, the *divine Interpreters* and *Moſaic Aſtronomers* would reduce all Improvements in ſpeculative or practical Science to the *Scripture Teſt and Standard,* (as *Berkeley* and others as abſurdly attempted in the Time of *Newton*) who would impoſe *traditional* Knowledge, *Faith,* or what only concerns the Influence of Mens Lives, for *demonſtrative* Truth in *Calculation.* As by wreſting the common Import of Words, *Moſaic* Hiſtory and Chronology, are miſtermed by *Kennedy,* in his Book, *Moſaic Aſtronomy.*

To

To our INGENIOUS CORRESPONDENTS.

☞ WE hereby acquaint our *mathematical* and other Correſpondents, ſo much as they profeſſedly with the *Palladium's Proſperity*, that unleſs they will be pleaſed to find *new Methods* to take a greater Number yearly of that Production off the Bookſeller's Hands, or raiſe the Price thereof, that conſidering his preſent great Expence to print and the Author's ſmall Reward to write, it will be continued no longer. The *additional Quantity* of Matter in this *Palladium Extraordinary*, raiſing the Price to 1s. 6d. being all Expedient ſolely for continuing it this Year only, without Loſs to the Bookſeller and Author. But whereas the Matter is copious, difficult, and expenſive to print, the ſame *Palladium* ſhould be ſold for 2s. inſtead of 1s. 6d. the *Price* now fixed; when (*and not otherwiſe*) the Sale of the Impreſſion would defray the Trouble and Expence of writing and printing it.

We find to our Surpriſe, that there are ſeveral *Mathematicians* and profeſſed *Well-wiſhers* to Science, who reproach the *Backwardneſs* of others to promote laudable and uſeful Science, who, though they can afford it, will not themſelves be at a ſmall Expence in purchaſing the Books of Science publiſhed they approve; but uſe other Means to inſpect them. — Who, not ſetting Example in what they ſo earneſtly recommend, are like thoſe pious *Inveighers* againſt *Vice* and *Folly* in others, who are not without their own *Offences*.

CHRONOLOGICAL REMARK.

FROM the End of 1700 to the End of 1800 ſince *Chriſt*, we have *lately* heard obſerved, by Mr. *Rivet*, '*is in the 18th Century current*,' making the Century, as well as the ſingle Year current, more by 1, than the complete Century, or Year, (*which is no Wonder.*)— On which we remark, that all former Figures of any *numerical Date*, denote the Years complete; as the laſt Year ſignified by the laſt Figure of the *Date* is *current* only. Therefore, if any Perſon changes the *common Notation* of Centuries, or *ſurplus* Years complete, for Centuries, and *ſurplus* Years current, it is the ſame, in Effect, as if he changes the *Name* of an *Engliſh* Shilling for an *Iriſh* 13 Pence, or other ſettled Names of Things, to make them ſignify contrary to Cuſtom. — Whence *Miſunderſtanding*, *Confuſion*, and *Error*, muſt follow; and all eſtabliſhed *chronological* and *aſtronomical* Rules, depending on the common Dates and Diſtinctions of Time, muſt fail of their End. Therefore, to prevent *Impropriety* and *Error*, the 1763d Year current ſince *Chriſt*, may be denominated, *the 17th Century completed*, (as it ever meant) and 63d *Year current*, not the 18*th Century current*, and 63d *Year current*; making more Years current than 1, which never was uſed by *Newton*, *Halley*, &c.)

To our worthy SUBSCRIBERS *and* ENCOURAGERS *of* SCIENCE.

⁂ *THE eight Subſcribers for the Ladies Diary Queſtions, Ænigmas, and for the Supplemental Aſtronomer, are deſired to give us Notice to* Mr. Cole's (*Poſt paid,*) *where they can be ſent to; whom we thus acquaint, that no Bookſeller would undertake the Hazard of printing at great Expence the ſaid Volumes, as we propoſed with a View to oblige and promote the Cauſe of Science.* That, unleſs we had a ſufficient Number of Subſcribers we ſhould ſuſtain conſiderable Loſs by printing them, which we therefore were forced to decline. But having ſuſtained greater Loſs in collecting the Materials, than the Value of all the little Money we received, (though we expected to have met with other Encouragement) we are ſorry to find that it is worth no Perſon's while to write Science on ſuch Terms; and therefore we hope our 8 *Subſcribers* will ſtill be Encouragers of Science, by taking off our Hands a *Royal Aſtronomer in Sheets*, for his Half Guinea (paying 2s. 6d. more, the Price to Subſcribers) inſtead of *requiring* us to return his Money, as we propoſed, when we could not gueſs at the Diſappointment we find; we having a Deſire to acquit ourſelves of the Obligation conferred on us, (as Honour requires) without finding too great Diſadvantage.

FINIS.

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MUSEUM